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# USSR Report

## TRANSPORTATION

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22 June 1984

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TRANSPORTATION**

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CIVIL AVIATION

DEPUTY MINISTER ON CIVIL AVIATION CONSTRUCTION PROJECT WORK

Moscow VOZDUSHNYY TRANSPORT in Russian 26 Apr 84 p 2

[Interview with Leonid Stepanovich, deputy minister of civil aviation, by correspondent V. Solov'yev: The Rhythm of the Projects Nearing Completion"; date and place not specified]

[Text] [Question] Leonid Stepanovich, in his speech at the CPSU Central Committee April (1984) Plenum, comrade K.U. Chernenko underlined the need to further intensify economic activity and the impermissibility of any kind of weakening whatever in fulfillment of the state plan. From this standpoint, how do you assess the work of the Ministry of Civil Aviation in capital construction in 1983, as discussed at the recent Ulyanovsk meeting?

[Answer] The brilliant and content-filled speech of CPSU Central Committee general secretary comrade K.U. Chernenko at the CPSU Central Committee April (1984) Plenum and the materials of the first session of the USSR Supreme Soviet 11th Convocation have armed the party and all Soviet people with specific instructions for carrying out current and long-term tasks at the present stage in the development of our society. We have reached an extraordinarily crucial frontier in the 11th Five-Year Plan, when the score is now being kept month by month. The state of affairs stipulates the need to step up economic work and be uncompromising with any kind of disruption or omission.

Support for the initiative of the masses, the dissemination of leading experience, broader competition, and stricter accounting for mistakes--these are party demands and they set the tone for the talks held by the construction workers in Ulyanovsk.

Most civil aviation administrations, aviation enterprises, plants, and training establishments coped not at all badly with their set tasks. For all indicators, the 1983 plan was successfully fulfilled by the Armenian, Krasnoyarsk, Arkhangelsk, Ukrainian, Azerbaijan, Latvian, Tyumen and Yakutsk administrations, the Kiev and Moscow civil aviation institutes, the Aktyubinsk, Buguruslan, Krasnokutsk and Troitsk schools, and civil aviation plants nos. 73 and 406.

For the sector as a whole the target for the commissioning of fixed capital was fulfilled 100.4 percent, for commercial construction production 109.5 percent, and for the commissioning of total housing area 140.6 percent.

A considerable number of production projects became operational. They included automated air traffic control systems in Krasnodar and Khabarovsk, and automated air traffic control systems in Rostov-on-Don and Simferopol that were handed over for state testing; four airports that were reequipped to receive aircraft in ICAO Category I weather conditions; and six airports where landing facilities were installed. The runway was lengthened at Sukhumi and reinforced at Norilsk.

A large volume of work was completed on maintenance of ground facilities. The annual plan for this indicator was overfulfilled 3.5 percent.

[Question] Achieving success in capital construction is impossible without shock labor on projects about to be commissioned. Today we are able to survey the 1983 projects nearing completion in light of the annual results. What do they tell us?

[Answer] A project nearing completion is a reflection both of the client and the subcontractors. It is like a mirror in which can be seen any lack of order or of organization; and such things are far from faultless.

Let us take just one example, namely a signal of criticism from a newspaper about the shortcomings in the construction of a 96-apartment residence in Barnaul. As a result of lack of organization, and I would even go so far as to say irresponsibility on the part of workers in the West Siberian Administration of Civil Aviation and the Barnaul aviation enterprise, this almost completed project has not been commissioned. Dozens of families of aviation workers have not improved their living conditions and the administration has not fulfilled its plan for the commissioning of housing.

I think that the newspaper VOZDUSHNYY TRANSPORT did a useful thing by publishing material under the rubric "The Project Nearing Completion" in its November and December issues. I could wish only that this purposeful work to throw light on the situation at the projects nearing completion had been started even earlier.

Annual plans were fulfilled only where the client provided the startup program with a full set of design and estimates documentation, provided full sets of equipment and cable products, and gave the construction workers assistance with personnel and mechanisms. With regard to the "Aviastroy" contract organizations, with them everything depended on the ability to concentrate the necessary amounts of material and labor resources at projects nearing completion, and on organizing the work precisely.

[Question] As is known, the construction workers failed to fulfill the plan in terms of all indicators...

[Answer] The limits for capital investments and construction and assembly work were not reached. The lagging came about through the inadequate work of individual collectives. Considerable shortfalls below the limits for construction and assembly work were permitted at projects that were being constructed by "Aviaremont," the Moscow Transportation Administration, the Far East, North Caucasus, Volga and Kazakh administrations, and the Training Establishments Administration.

The managements and party organizations of the lagging collectives should carefully analyze the causes of last year's failures and outline specific measures to overcome them. In order to reach the turning point here it is deeds rather than words that are needed to raise the responsibility of management personnel for faultless fulfillment of their duties. Construction proceeds successfully only where each person works conscientiously and with initiative on his own sector.

[Question] How did the "Aviastroy" PSMO [meaning unknown--ed] subdivisions end the year?

[Answer] I would say that the sector contract organization worked below its capacities. "Aviastroy" (chief: A. Voronin) successfully fulfilled the plan for commercial construction products, the commissioning of housing, and for profits... At the same time the contract plan for the association as a whole was not fulfilled, including the contract plan for work done using its own resources; and private assets were poorly assimilated. But the most important thing is that of the 18 "Aviastroy" subdivisions, only 7 fulfilled the plan for Ministry of Civil Aviation projects. Construction and Assembly Administration No 6 [SMU-6], SMU-12, SMU-18 and SMU-19 failed to fulfill a single planning indicator!

[Question] The paramount task that the sector is resolving is the accelerated construction of housing and social and everyday projects... Today these kinds of construction sites are regarded as the most important. What was done last year to resolve this problem?

[Answer] We are building up the rate of housing and municipal construction with each year that passes. Given each opportunity available, the plan is being overfulfilled for these indicators. Suffice it to say that with regard to the total area of housing, as we have already said, the plan was fulfilled 140.6 percent, and the limits for capital investments for housing were overfulfilled almost 11 percent. Taking into account the proportion handed over, in 1983 the organizations and organizations of civil aviation commissioned 265,500 square meters of housing.

The Arkhangelsk, Armenian, Tyumen, Yakutsk, Ukrainian, North Caucasus and Krasnoyarsk administrations achieved considerable overfulfillment of the plan for commissioning housing. At the same time, the Volga Administration fulfilled the plan only 27 percent, while the figures for the East Siberian Administration and the Georgian Administration were only 54.6 and 72.9 percent respectively.

In Sukhumi, Kuybyshev, Khabarovsk, Mogocha and Krivtsova the blame lies with the construction and assembly administrations of "Aviastroy."

The negligence of the client (the Uzbek Administration of Civil Aviation) is the only way to explain the fact that in the construction of a kindergarten in Urgench all limits for annual capital investments were reached but the project itself was not commissioned. Even though right up to the very last day of last year the administration was reporting that the kindergarten would be commissioned!

Should we not be concerned for the children in Urgench or, for example, in Anadyr, where another kindergarten was not commissioned?

At the local level, poor use is being made of that important reserve for obtaining housing represented by the housing construction cooperatives. It is quite inadmissible when, for example, the East Siberian Administration of Civil Aviation failed to assimilate a single ruble of the R200,000 allocated for the housing construction cooperative; and likewise in the Arkhangelsk Administration, where only R45,000 was assimilated from an allocation of R500,000. In 1983 things also went badly with the housing construction cooperatives in Yerevan and Kiev.

This year seven cooperative houses have been planned. From the very first days these projects should be brought under the unremitting control of management and the public organizations. The 1984 plans for cooperative construction must be fulfilled unconditionally.

[Question] A final question. Now that the first quarter is complete, how were the results? What are the features of this year's plans?

[Answer] Construction workers in the sector got off to a successful start in 1984. During the first quarter the ministry fulfilled its tasks for all indicators in construction. The planned areas of housing and hostel space were commissioned.

One of the main features of this year's plans is that the number of newly started projects has been reduced. Most resources will be concentrated on projects nearing completion.

Special attention should be paid to the construction of housing and social and everyday projects and to automated air traffic control systems.

At this stage efforts should be aimed at the unconditional fulfillment of plans for the first half of the year and for the annual plan as a whole, for all indicators, as demanded by the decisions of the 26th CPSU Congress and the CPSU Central Committee February and April (1984) plenums.

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CIVIL AVIATION

DEPUTY MINISTER ON CIVIL AVIATION S&T EFFORTS

Moscow VOZDUSHNYY TRANSPORT in Russian 14 Apr 84 p 3

[Article by I. Mashkivskiy, deputy minister of civil aviation: "In the Interests of the Branch's Development"]

[Text] The Soviet people have every reason to be proud of the achievements of Soviet science. On this basis such contemporary branches as nuclear power engineering, space technology, the electronics and microelectronics industry, the production of synthetic materials, and many other are developing swiftly. From year to year scientists, engineers and technicians, and designers are making an ever more significant contribution to the build-up of our country's scientific and technical potential. They are lent wings and inspired by the evaluation which was heard at the 26th CPSU Congress: "The party of communists proceeds from the fact that the building of a new society is simply unthinkable without science."

Soviet scientists, including a large detachment of scientific personnel of civil defense, are now greeting their holiday in an atmosphere of lofty political and labor enthusiasm caused by the decisions of the April (1984) plenum of the CPSU Central Committee and the first session of the USSR Supreme Soviet, eleventh convocation. Together with the entire people, figures of science and technology greeted with inspiration the news of the election of Comrade K. U. Chernenko, General Secretary of the CPSU Central Committee, as Chairman of the Presidium of the USSR Supreme Soviet.

Thanks to the constant concern of the party and the government, Aeroflot is now one of the scientifically and technically leading branches of the national economy. It will be no exaggeration to say that everything better and everything contemporary which is being created by Soviet science is finding rapid application in Soviet civil aviation. This is why we now have such aviation equipment as the Il-86, Il-62, Il-76T, and An-24 airplanes and the Mi-8, Mi-6, and Mi-10K helicopters. The popularity of air transport is increasing steadily--during one flying workday alone our airliners transport to various regions of the country and deliver abroad about 600,000 people. It is impossible to imagine the further development of the natural wealth of the North, Siberia, and the Far East without aviation.

Also universally recognized is the role of civil aviation in the intensification of agriculture, the conduct of terrain mapping, land management, and geological prospecting, and the building of railway mainlines, hydroelectric power plants, and oil and gas lines.

The pilot scientific-research organization of Aerflot is GosNII GA [State Scientific Research Institute for Civil Aviation]. Here new ideas are born and studied in the field of planning and forecasting the development of the branch, improving flying and technical operation, and the repair of aviation equipment; here state, operational, check-series, and special tests of airplanes and helicopters are conducted; and from here emerge recommendations on raising the level of safety and regularity of flights, the reliability and durability of equipment, and a growth in the effectiveness of its use.

The biggest subdivision of the institute is the LIK--the flight-testing complex where such famous aviators as honored test pilots of the USSR V. Mezokh and V. Popov, honored pilots of the USSR M. Kuznetsov and V. Klyaus, and other high-class specialists are working. In recent years LIK has accomplished a large volume of flight studies and tests to create and introduce on-board automatic systems which ensure flights in accordance with the ICAO category II minimum on the Il-62, Tu-154, and Tu-134 aircraft and develop on-board navigational complexes. They also underwent tests on Il-62 and Tu-154 aircraft in accordance with the ICAO category IIIA minimum, the introduction of which will increase significantly flight safety and regularity.

It should be stressed that scientific studies in the field of flight safety are one of the important directions in the institute's activity. Thus, the principles of the method of "factor analysis" of the status of flight safety which were developed by its associates are contained in the "Bezopasnost'" [Safety] control system--a system which possesses great capabilities from the standpoint of preventing aviation accidents. Studies being conducted now in GosNII GA and TsNII ASU GA [Central Scientific Research Institute for Civil Aviation Automated Control Systems] are directed toward the system's further development.

An urgent and, at the same time, difficult combined problem of civil aviation which occupies almost all subdivisions of the pilot institute to one degree or another is the development of progressive methods to economize fuel-energy resources. They are diverse, these methods--from the creation and introduction into operation of new, more economical aircraft and the improvement of systems for navigation and UVD [air traffic control] to a broad spectrum of measures which are used during flight and technical maintenance of aviation equipment. In particular, the institute has developed and introduced fuel consumption standards for airplanes of all types, created a procedure for analyzing reasons for overconsumption of fuel in the branch's subdivisions, provided recommendations for the reduction and normalization of aviation fuel and lubricant consumption during the maintenance and repair of aviation equipment, and much more. By the way, scientists cannot rest on their laurels: their duty is to continue indefatigably the search for deep-seated reserves for economizing aviation fuel.

Scientists of the Scientific Experimental Center for the Automated Control of Air Traffic, the Central Scientific Research Institute for Automatic Control Systems, and the Main Computer Center are continuing on a broad scale the

mastery and introduction of on-board and ground radio engineering equipment which ensures the automation of air traffic control and the navigation and landing of airplanes and increases flight safety and regularity.

There are also many creative achievements to the credit of the GPI [state planning institute] and the Civil Aviation "Aeroprojekt" [Aviation Project] Scientific Research Institute which marks its 50th anniversary this year. The associates of this institute are accomplishing various planning-investigation work on the entire complex of airports, aviation repair enterprises, and other facilities of the branch. Every year new airports are being constructed in our country and airports which are being reconstructed and which include airfields, passenger and freight air terminals, hangars, and structures which support landing, radio navigation, and air traffic control are acquiring a young appearance. And in all this are the labor, inspiration, and skill of the Aeroflot designers, engineers, and builders.

The scientists of our branch are participating more and more actively in the improvement of the technological processes of flight support. Here, a scientific approach is used which permits shifting from the employment of individual machines and mechanisms to the creation of combined systems intended for specific technological processes. This pertains to the creation of airfields, the maintenance of airplanes, the processing of baggage and cargo, fuel supply, and other labor-intensive operations. Recently, a program for the creation of progressive ground equipment has been developed by the efforts of our scientists, designers, and engineers.

Considering the increasing requirement of the national economy for special-purpose aviation, the volume of scientific studies being accomplished by our institutes is constantly growing. In particular, scientists and specialists of the branch are making an important contribution to the creation of technology for the application of mineral fertilizer, methods for combatting agricultural and forestry pests, and to the development of requirements for special-purpose aircraft.

Meanwhile, if the achievements of our scientific organizations and institutions are evaluated in the party manner and critically, it should be said directly that there are still many "sore" spots and there are still many sectors which require the acute attention of the scientists, engineers, and innovators of production.

The Aeroflot scientific research institutes nevertheless do not render sufficient methodological and practical assistance to civil aviation enterprises on questions of raising the efficiency of production and improving the control and organization of production. We should put an end to the practice which exists in places where scientific personnel do not visit production collectives for months and even years and therefore have a poor notion of their urgent interests. Isn't that why, in particular, the times for the working out of important scientific problems are inexcusably dragged out? By the way, it should be said that higher educational institutions which have a great scientific potential are not sufficiently involved in their solution.

There can be no putting up with the fact that automated means and methods for processing the results of flight tests are being introduced into the GosNII GA at insufficiently rapid rates. The result of such an approach to the matter is obvious--the process of important scientific studies is slowed down and the practical use of their results is greatly moved back in time.

Studies are being conducted in insufficient volumes on the development and improvement of progressive methods for the operation and repair of aviation equipment--with the aid of the combined diagnosis of its condition using on-board recorders and reliable monitoring systems. Of course, this is a scientific problem for today--one of the most difficult, but scientists should display all the more persistence and purposefulness for its most rapid solution.

Finally, we cannot fail to be concerned by the fact that work connected with the creation of new means of mechanization for airports is nevertheless conducted insufficiently by the branch's scientists and designers. For example, the Aeroflot workers are waiting until highly effective machines for the high-speed clearing of airfield pavements and other mechanisms which facilitate laborious processes will be placed at their disposal.

In short, our scientists, engineers, designers, and innovators have a vast and abundant field of activity and there are many urgent problems which require their talent, experience, initiative and, if you will, obsession. We stress here: in order to solve successfully the tasks on the creation and introduction of new aviation and ground equipment, strong collaboration is necessary between the scientists of Aeroflot and those who participate in ordering equipment as well as with those who will operate it. Closer cooperation should also be organized between the branch's science and industry's research organizations. The level of requirements imposed on the quality of new generation aviation equipment should be high as never before.

Being the biggest aviation company in the world, Aeroflot is also successfully developing scientific and technical collaboration with civil aviation departments of foreign countries and international organizations. These ties are being implemented within the framework of long-term special-purpose programs on the solution of the most important problems.

For example, the CEMA Permanent Commission on Civil Aviation has created scientific-technical councils which coordinate the studies of scientific organizations of the CEMA member countries. Prospects for the development of aircraft and the problems connected with their future employment and the integrated development of international airports are being studied jointly. Great attention is being devoted to the creation and improvement of traffic control systems, raising the level of flight safety, and other urgent tasks.

...The comprehensive strengthening of the alliance of labor and knowledge and the ever closer integration of the branch's science with aviation production--this is the necessary, reliable, and correct path leading Aeroflot to the successful accomplishment of immediate and long-range tasks.

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CIVIL AVIATION

MAGADAN ADMINISTRATION OFFICIALS PUNISHED FOR OFFENSES

Moscow VOZDUSHNYY TRANSPORT in Russian 28 Apr 84 p 2

[Unattributed report: "Maneuvering Not with Equipment But with the Records"]

[Text] On 23 November 1982 an article was published in our newspaper under the above title. It told about the Seymchan aviation enterprise in the Magadan Administration of Civil Aviation.

In September last year cabbages were shipped from Seymchan to the regions of Chukotka. From the first days of the month to almost the end of the month, the An-26 flights shipping the cabbages were recorded as freight operations, and this was right and proper. In the words of the above-mentioned article: "However, through maneuvers accomplished by the pens of workers in the planning and economic department of the administration and the enterprises shipping the cabbages, the cabbages were shown as something else: they were redesignated as flights coming under the Administration for the Use of Aircraft in the National Economy [PANKh]. 'So what' the uninformed person will say. 'The work has been done, and what significance is there in where the tons, hours and kilometers are recorded?'"

Well, there is a significance. Switching the records from one schedule to the other enabled the Seymchan people, without any special effort, to fulfill the plan for PANKh work 140.1 percent. The figures were also successfully written into the quarterly report. They also had an effect on the indicators for the administration as a whole. It turned out that the quarterly plan for the administration was fulfilled 101.4 percent.

The reality was somewhat different. In fact the Seymchan aviation enterprise fulfilled the plan only 73.5 percent, while the administration fulfilled it only 95 percent.

It was established that records had been falsified, including the incorrect posting of 649 hours of An-26 flights for PANKh work.

Having examined the question of the violation of state discipline, expressed in the falsification of records, the bureau of the Magadan CPSU Obkom expelled from the CPSU V. Zharov, first deputy chief of the Magadan Administration. V. Kostomarov, chief of the production organization section, and T. Pozdnyakov, administration chief economist, were also expelled from the CPSU.

A. Yershov, chief of the Magadan Administration of Civil Aviation, was strictly censured, with endorsement of his party card, for low exactingness and lack of control in observing state and financial discipline.

On orders from the ministry, the first deputy chief of the Magadan Administration, V. Zharov, was fired from his post "for serious shortcomings in work and the falsification of records." T. Pozdnyakov the chief economist was also relieved of his duties.

The court considered the actions of V. Zharov, V. Kostomarov and T. Pozdnyakov as an attempt to steal state monetary assets in the form of illegal acquisition of bonus payments in large amounts both for their own use and for the use of other persons. V. Zharov, V. Kostomarov and T. Pozdnyakov were sentenced respectively to suspended sentences of 3, 2, and 1 year on condition of mandatory conscription to labor. They were deprived for a period of 5 years of the right to occupy posts connected with organizational and financial and administrative and management duties.

The sentence of the RSFSR Supreme Court cannot be appealed.

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CIVIL AVIATION

COLLEGIUM NOTES CARGO THEFT PROBLEMS IN AVIATION SECTOR

Moscow VOZDUSHNYY TRANSPORT in Russian 28 Apr 84 p 1

[Unattributed report: "In the Collegium of the Ministry of Civil Aviation"]

[Text] The question of "fulfillment of measures to insure the safekeeping of socialist property in civil aviation" has been considered at a regular meeting of the Ministry of Civil Aviation Collegium. It was noted that in light of the demands of the 26th CPSU Congress and subsequent CPSU Central Committee plenums, a set of measures is being implemented in the administrations, organizations and establishments of civil aviation to instill in aviation workers a solicitous attitude toward socialist property, strengthen discipline and order, and close the channels open for theft, mismanagement and squandering of the national assets.

In each aviation enterprise specific measures have been worked out and implemented to insure the safekeeping of socialist property. Measures have been adopted to improve the technology for freight-handling processes, primarily to insure the safekeeping of cargo, mail and baggage.

The creation of control-and-inspection organs in the central apparatus of the ministry and at the local level as independent structural subdivisions has improved the quality of inspections and their efficacy and effectiveness. The situation in warehousing has been improved. In 1983 the Ministry of Civil Aviation for the first time assigned R3 million specifically for improving the facilities at loading warehouses and the construction of covered pier works for the purpose of further insuring the safekeeping of cargoes.

At the same time, the unsatisfactory organization of transit cargo handling is a cause of serious unfavorable criticism; this has led to unjustified transshipments, failure to meet delivery schedules, and losses and spoilage in the North Caucasus, Azerbaijan, Volga, Ukrainian, Urals, West Siberian and East Siberian administrations.

A resolution was adopted on the question considered.

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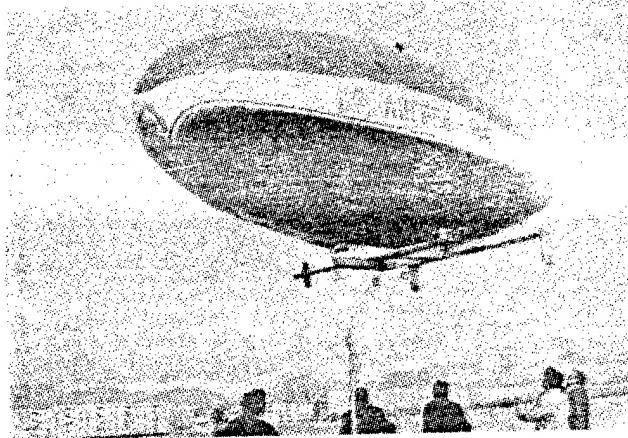
CIVIL AVIATION

SMALL RADIO-CONTROLLED DIRIGIBLE TESTED IN UZBEKISTAN

Moscow TRUD in Russian 4 Apr 84 p 4

[Article by T. Savel'yeva: "A Baby Dirigible"]

[Text] This small dirigible is now successfully undergoing tests near the city of Angren, Uzbek SSR. It rose into the air alone, without man's visible participation. The pilot-operator controls the craft from the ground using a special control panel and it obediently executes all the person's commands.



The Angren-84

The dirigible was assembled at the Angren "Rezinotekhnika" [Rubber Equipment] Plant under the direction of engineers Sh. Komalkhadzhayev and I. Iskandarov. The material from which its casing is made was developed by associates of the special planning and designing section of "Energoaerotrans" [expansion unknown] jointly with Angren specialists. It is of comparatively small dimensions and is distinguished by high electric conductivity and low gas permeability. The craft rises into the air thanks to two internal combustion engines which are mounted on rotatable wings beneath the casing. Following a radio command, the wings control the flight altitude and the craft's ascent and descent.

As related by the head of the Department of Flight Dynamics and Casing Materials of the "Energoaerotrans" PKO [planning and design section], Candidate of Technical Sciences M. Derkovskiy, the baby dirigible whose length is nine meters and whose diameter is three meters can accomplish a number of practical tasks. Being separated from the control panel by three to five kilometers and climbing more than 100 meters, the craft will help agricultural workers to spray plants and combat pests. It can also perform motion picture photography and establish radio and television communication.

After the conclusion of tests and the modification of the design, a test batch of the radio-controlled craft will be manufactured.

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## CIVIL AVIATION

### RIGA CIVIL AVIATION ENGINEERING INSTITUTE'S R&D WORK

Riga SOVETSKAYA LATVIYA in Russian 7 Apr 84 p 4

[Interview with V. Ya. Makeyev, prorector, Riga Red Banner Civil Aviation Engineering Institute, for scientific work, candidate of technical sciences, by V. Egle; date and place of interview not given]

[Text] The Riga Civil Aviation Engineering Institute not only trains specialists for the country's air fleet. Important scientific research work is conducted here. This is discussed in a talk with our correspondent by the prorector of the Riga Red Banner Civil Aviation Engineering Institute for scientific work, Candidate of Technical Sciences V. Ya. Makeyev.

"The decree of the CPSU Central Committee and the USSR Council of Ministers, 'On Measures to Accelerate Scientific and Technical Progress in the National Economy,' was published last August," said Valeriy Yakovlevich. "We perceived this document as a program of action, striving to make the maximum contribution to the accomplishment of urgent tasks. More than 900 of the institute's associates are now participating in scientific work. Their efforts are directed toward raising flight safety and the reliability of aviation equipment, the introduction of new methods for the maintenance and repair of airplanes and various ground equipment, a savings in fuel and energy resources, and participation in the realization of the Food Program."

"It is not by chance that two concepts are stressed in the decree--efficiency and acceleration. Because the intensive development of the national economy depends precisely on these factors. And for us, this means more thorough planning and the optimum distribution of personnel and financial and material resources. Unquestionably, a rise in the productivity of our scientists' work will be furthered by the strengthening of long-term ties with production and the development of socialist competition."

[Question] What developments which have been created in recent years are already being used in practice?

[Answer] Each year the results of 25-30 of our scientific research and test design projects are introduced at the country's civil aviation enterprises. We can include among the most significant the introduction of an automated system for the analysis of repair quality and engine reliability. This permitted

facilitating the work and increasing the productivity of labor significantly. The annual economic impact from such an innovation was more than 600,000 rubles.

Original technology for servicing ground flight support equipment has been successfully introduced. Communication and radar reliability increased an average of 1.8-fold and the labor intensity of preventive maintenance work was almost cut in half. Here the economic impact was more than 1.7 million rubles.

The commercial production of a sea-ice thickness gage which was created in Riga has begun. SOVETSKAYA LATVIYA has already told its readers about it. I will only recall that it is the result of the creativity of the scientists in the problems laboratory for aviation subsurface radar. It is employed under the severe Arctic conditions. Last autumn, our instrument was successfully used when conducting a convoy of cargo ships which had become icebound.

The scientists of the Riga Civil Aviation Engineering Institute [RKIIGA] are working in close creative contact with specialists of the Latvian Civil Aviation Administration. A system of automated pre-flight training of navigators for any trips and all types of airplanes was developed jointly and is operating successfully. The drilling of crews has been accomplished for four years already on specialized navigation simulators created in the institute. An automated system for objective evaluation of the crews' activity has been introduced on a combined simulator of the Tu-134B airplane. The Riga airport has received test models of diagnostic instruments which were developed and made in the institute.

[Question] Please tell us what has been done for agriculture and other branches.

[Answer] In our laboratory, studies of the operating characteristics of aircraft, aircraft engines, and agricultural equipment developed the theoretical foundations for a new wide-span ducted duster to apply fertilizer to the fields. And the theory was embodied in metal by Kiev specialists. Tests showed that its productivity is considerably higher than the one now being employed. New types of aviation spraying equipment installed on the An-2 and An-3 airplanes are also being created.

Instruments are now being developed for prospecting for peat deposits in Latvia and ground water in Kazakhstan.

[Question] With which civil aviation enterprises has contact been established and what are the results of such collaboration?

[Answer] Each year, work is conducted in the institute in accordance with agreements on collaboration with enterprises and scientific research organizations of the branch. In comparison with the preceding five-year plan, the times for introduction have been reduced by more than half a year. An automated system for the diagnosis of functional systems of the Il-86 airplane which was created by our scientists became an important contribution to the development of air transport. Its introduction with the participation of Moscow specialists ensured a higher level of organization in maintenance of this type of airliner.

The effectiveness of collaboration with production enterprises and organizations often depends on their degree of interest and initiative. The introduction of an indicator device for the approximate analysis of water contained in aviation fuel became an example of such cooperation and mutual understanding. It is the fruit of the joint labor of scientists of RKIIGA, the Latvian Civil Aviation Administration, and the Civil Aviation Scientific Research Institute.

About 50 of our scientific developments were introduced last year. Their total economic impact was more than five million rubles.

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MOTOR VEHICLES AND HIGHWAYS

KIRGHIZ OFFICIALS SCORED FOR MOTOR TRANSPORT ABUSES

Frunze SOVETSKAYA KIRGIZIYA in Russian 22 Mar 84 p 2

[Article: "Use Transport Effectively"]

[Text] The Kirghiz SSR People's Control Committee has examined the question of the use of automotive transport in the Kirgizstroytrans Trust of the Kirghiz SSR Ministry of Construction.

It is pointed out in the adopted decree that many shortcomings are being tolerated in the use of automotive transport and fuel and lubricants are being overexpended in the work of the Kirgizstroytrans Trust (the manager is Yu. Muratidi). In 1983, the runs of motor vehicles reached almost 2.6 million kilometers above the limit and 540,000 liters of gasoline were unnecessarily written off.

Through the fault of the trust's operating service (the deputy manager is V. Zagorodnyy), the required coordination between the truck fleet and the building organizations is lacking.

The transport workers are reconciling themselves to cases of gross violations in the formulation of freight transportation documents. The leadership of the trust treats tolerantly the numerous cases of unproductive operation of vehicles and their above-norm demurrage during loading and unloading operations while awaiting the compiling of documents. This leads to additions. An addition of 42,900 tons and 508,000 ton-kilometers of freight turnover was ascertained through a spot check of the truth of freight shipments. Because of this, 78,800 liters of fuel were illegally written off and drivers were paid 5,300 rubles of unearned money.

Serious deficiencies exist in the organization of repair work and technical maintenance (the chief engineer is G. Khash). As a result, the target for using motor vehicles is regularly not fulfilled. In 1983, it was fulfilled by only 96 percent. As a result, more than 5,000 machine-days were lost last year. This is the equivalent of four days of work by the entire trust. The target for using trailers has also not been fulfilled. The departure of motor vehicles on the line with non-working and unsealed speedometers is being tolerated. This provides an opportunity to make additions easily. Systematic work to strictly monitor the rational use of fuel and lubricants has not been organized.

A great deal of guilt for the existing shortcomings belongs to the republic's Ministry of Construction. It does not delve deeply into the trust's work and is not increasing exactingness on personnel in matters pertaining to improving the use of transportation. After the publication of the party and government decree on this question, the activity of the trust was not analyzed critically and the necessary work directly on the spot to eliminate the violations, was not expanded. Demurrage is not being decreased because of this. Even with an unsystematic accounting of it, penalties worth 61,000 rubles were extracted from construction organizations and construction industry enterprises in 1983 for demurrage.

The committee decided that Yu. Muratidi, the manager of the Kirgizstroytrans Trust, should be reprimanded for the lack of control, which was demonstrated in the use of automotive transport, and for the serious shortcomings, which were tolerated in this matter; and that V. Zagorodnyy, his deputy, should be sternly reprimanded. Considering the fact that considerable material damage had been inflicted on the state by the addition of unperformed work and the overexpenditure of fuel and lubricants, a monetary fine in the amount of two months salary was imposed on Yu. Muratidi and V. Zagorodnyy as partial compensation for this damage.

G. Khash, the trust's chief engineer, was reprimanded and a monetary fine in the amount of two month's of official pay was imposed on him for the shortcomings that were allowed in the organization of repair work and the technical maintenance of the automotive transport, which led to the decrease in its use, and also for the existing cases of the departure of motor vehicles on the line with non-working speedometers.

A. Chigintsev, chief of the mechanization, power and transportation department of the republic's Ministry of Construction, was sternly reprimanded for the serious shortcomings in organizing the monitoring of the use of automotive transport in the construction organizations and for his unprincipled attitude toward the deep-rooted cases of additions during the shipment of freight. E. Bakeyev, the first deputy minister of construction, received a stern warning.

Comrade Bakeyev's statement that the ministry would institute proceedings against the construction organization directors, who were guilty of the revealed facts, and that the question of improving the use of truck automotive transport would be heard in the near future during a session of the ministry's collegium, was taken into consideration.

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MOTOR VEHICLES AND HIGHWAYS

JURISDICTIONAL DISPUTE PREVENTS ROAD REPAIR

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Mar 84 p 2

[Article by R. Sarimov: "The Road Is Not Dusty, But the Bridges Shake"]

[Text] He, who travels a great deal, suffers a great deal. Once, I travelled in a truck, which was going my way, from the station of Shentala to the rayon center of Cheremshan. It would be more accurate to say that I did not travel but jumped over the holes and bumps. Now, the truck dives down; now, it again flies to the crest. When I finally get off, I walk directly to the Cheremshan Rayispolkom.

I say to the chairman: "What a road you have! Evidently, they do not call it the road of life for nothing. It is not so easy to survive on it."

Zh. Talipov corrected me: "That's not at all why. It has vitally important significance for our remote rayon since it is the only one between the rayon center and the railroad station."

"Why don't you make it a good one?"

"We did, but the people of Shentala did not want to continue it."

It seems that six or seven kilometers of this 25-kilometer road run on the territory of the Cheremshanskiy Rayon in the Tatar ASSR, but the remaining kilometers pass through and are in the possession of Shentalinskiy Rayon in Kuybyshev Oblast. All of the difficulty is here -- in the inter-oblast barrier.

One road -- two approaches. For the people of Cheremshan, it is like life; but for the people of Shentala it is like an appendix from which there is only inconvenience. The people of Shentala do not need the road; there is no where to travel on it. That is why the Shentala Road Repair and Building Administration does not hurry to meet with the people of Cheremshan. The latter, understandably, cannot construct a road in a foreign oblast using the resources of their local budget. They turned for assistance to the higher organization of the Shentala road workers -- Kuybyshevavtodor. The cart, as they say, is now there. It has been covered in bureaucratic potholes and ruts.

But what about the RSFSR Ministry of Highways? You see, one should look not from local bell towers but from state watchtowers from where it is more visible. Knowing this, the people of Cheremshan bombarded the ministry with "petitions". It responded to them with reciprocity, that is, it poured out just as many responses to the petitioner. It is somehow awkward to call these warm and reassuring messages by the bureaucratic word "an answer written for the sake of form only" since the instructions of Kuybyshevavtodor to assist in every way possible in the movement from point Ch. to point Sh., were enumerated in them.

The chairman thumped the small armful of yellowed documents on the desk: "Here they are!".

The beginning of the many years of correspondence started 13 years ago when the young and optimistic Zh. Talipov, as an enthusiastic worker correspondent, travelled the entire difficult route with a camera around his neck and made prints of the unique profile of the road in all its aspects. Then, he sent the photographs of the unusual landscape to the ministry....

At the time, they dispatched a grader with a bulldozer to them. With the help of this equipment, the people of Cheremshan raised the bed of the road to a height that was unprecedented previously. In their labor excitement, they even crossed the border of the oblast and drove the ill-fated road almost to the station itself. However, the road, which did not have a hard covering, was again transformed into a jumble because of the intense motor vehicle transport movement. It is good that the higher road authorities have supported the people of Cheremshan for all of these years with consoling promises. They wrote from Moscow: "The Main Administration for the Construction and Operation of Highways in the South has issued instructions to Kuybyshevavtodor to complete the construction of the Cheremshan-Shentala road with a hard surface on its entire length in 1975.... and subsequently to maintain it in a condition which supports the year-round normal movement of automotive transport".

They say that the people of Cheremshan went about happily excited for a long time after this -- at least until the main administration chilled them with its next letter. This time, they notified the petitioners to put up with the ill-fated road. Kuybyshevavtodor will not be able to do it not only in 1975 but even in 1976. Thus, they said, suffer still....

Upon my return to Moscow, I dropped in on the former Main Administration for the Construction and Operation of Highways in the South, which is now called "Rosdoryug".

Having looked through a document case with the correspondence, I. Antonenko, its present director, offered: "Yes! A history, it seems, with a beard."

When we parted, Ivan Fedotovich promised to communicate immediately with Kuybyshevavtodor and assist the people of Cheremshan. I was informed several days later that the people of Kuybyshev had again included the sadly known

road in the plan for the year. They promised to complete it once and for all and irrevocably.

A year passed and another arrived.

I ask K. Akhmetzyanov, a RSFSR Supreme Soviet deputy who had come from Cheremshanskiy Rayon to Moscow for the session: "How is the road?"

He sadly dismisses the matter with a joke: "The road is not dusty, but the bridges tremble. Last year, the people of Shentala did not advance a step toward us."

They do not say without reason that a habit is a second nature. Evidently, the directors of Kuybyshevavtodor have become firmly attached to promises. Perhaps, only a strong shock will be able to break them of this bad habit. However who will do it?

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## MOTOR VEHICLES AND HIGHWAYS

### MORE ON CREDIT CARD SYSTEM FOR GASOLINE PURCHASES

Moscow EKONOMICHESKAYA GAZETA in Russian No 12, Mar 84 p 15

[Article by N. Manuylov, special correspondent in the city of Novosibirsk:  
"Fuel-- for Credit Cards"]

[Text] The distribution of fuel for state transport using credit cards will begin to be introduced in 1984 in a number of the country's cities. This system was developed in Novosibirsk as an experiment. To what do its results testify?

#### The Reverse Side of the Coupon

We followed with G. Tikhonov, the chief of the Novosibirsk administration of the RSFSR State Committee for the Supply of Petroleum Products, the path of a coupon from the printers to the gas station and further. The oblast administration receives the coupons from Leningrad. The delivery and sale of them in only one oblast comes to almost 150,000 rubles a year for the administration (less expenditures for the paper to produce them and for their packaging). When this freight arrives in the oblast's two oil tank farms, it is opened, accurately counted again (thousands and thousands of pieces) and locked in a safe where there must be the appropriate temperature and humidity. Then, they say to the users: Come, receive them.

And a stream of motor vehicles -- cars, trucks and buses -- rush to the oil tank farms. In each vehicle, there is a driver and a cashier from the enterprise. From the city of Novosibirsk to the Krasnyy Yar oil tank farm, for example it is 30 kilometers -- a round trip of 60 kilometers. According to the calculations of the administration's workers, 700 tons of gasoline is spent in a year just to make trips for the gasoline coupons.

All 30 of the city's gas stations work in three shifts. There is a strict recounting with each shift changeover. Now it is necessary to return the cancelled coupons to the book-keeping department of the oil tank farm. There, a special commission, which again counts everything, works with them, draws up a report and, finally, burns the used coupons.

Hundreds of people are engaged in all nine accounting operations which accompany the coupon during its turnover.

Where is the way out? To give up the cumbersome and expensive coupon system! This is what they decided in Novosibirsk several years ago. The coupons have been replaced with credit cards.

#### Handy, Advantageous

The pioneers of this undertaking were the workers in the oblast petroleum products administration and the Novosibirsk branch of the Nefteprodukt Central Design Bureau automated control system. A program was developed by their efforts, and they are performing operating maintenance on the experimental equipment and process information in the computer center. The equipment was built by specialists from the Serpukhov Scientific and Production Association for Refueling Equipment.

Practically the new system looks as follows. A thin plastic credit card, which is small in size (hardly larger than a match box), is issued to a motor vehicle driver. The brand of fuel, the license plate number of the vehicle, what enterprise owns it, and name of the driver are encoded on it. The driver drops the card in the receiving unit and selects a code that is known only to him. The gas pump automatically delivers the required amount of gasoline into the vehicle's tank. The driver is completely in control. The operator does not have access to the released fuel.

A computer performs all the remaining work. When it has read the credit card, it enters on a punch tape its information and the amount of dispensed gasoline. Once a day (it is also possible during each shift), the computer center workers collect the punch tape from the machine and process it. A totals printout, on which what driver and how much and what kind of fuel he took (in kilograms and in rubles) are accurately established, is issued daily to the directors of all the enterprises whose automobiles are using this system. This document provides information in general about an enterprise. It reveals opportunities for precisely and effectively monitoring the expenditure of petroleum products directly in an enterprise.

It is practically impossible for another person to use the credit card: The receiving unit will "take" the card and not issue the command for fueling with the slightest inaccuracy in the code.

There is one aspect of no small importance: The productivity of credit card gas pumps is 1.6-fold higher than standard ones; and fivefold -- for one regular unit. The need for a large number of attendants decreases, and the work of economists and bookkeepers in the enterprises and on the oil tank farms is cut down.

A covering detachment has been set out against losses of petroleum products, abuses and misappropriations. In this respect, the example of the operation of motor vehicles in Novosibirsk's Ninth Automotive Transport Enterprise

using the credit system is typical. Here, 500 tons of petroleum products, basically gasoline, were overexpended during 1981. With the shift to credit, the overexpenditure of fuel did not exceed 30 tons in 1982, that is, it was curtailed by more than 16-fold. Savings, which exceed 20 tons, appeared last year.

All told, 17 of the city's enterprises and more than 7,000 drivers are now using the credit system.

#### The Prospects Are Reassuring

These are several of the experiment's results. Several problems were also revealed during it. The test batch of equipment, which was manufactured in Serpukhov, was not very perfect from a technical aspect. The work to improve the technical tooling of the fueling units for credit cards did not stop, and the plant has already delivered several sets of more reliable equipment to Novosibirsk now. Along with this, it has become clear that the plant is not in condition to satisfy the demand for the required equipment when the credit system is introduced on a broad basis. Here, there is only one way -- to enlist the forces of the Ministry of Instrument Making, Automation Equipment and Control Systems in the manufacturing of refueling equipment on a mass scale.

However, even the equipment, which now exists, permits the experiment to be expanded. In Novosibirsk, they have come close to combining "credit" gas pumps with the delivery of fuel to the owners of personal motor vehicles for cash payment.

The opportunity is being revealed to set up credit gas pumps not only on the long arms of urban passenger bus routes, for example, Novosibirsk-Akademgorodok, but also on the Novosibirsk-Omsk, Novosibirsk-Barnaul and Novosibirsk-Kemerovo intercity routes.

The all-union seminar on expanding the experiment, which was recently held in Novosibirsk, attracted specialists from all union republics. The seminar participants addressed a request to the workers of the enterprises in the Ministry of Instrument Making, Automation Equipment and Control Systems to accelerate the manufacturing of credit equipment for the country's gas stations. Perhaps, this is now the main question on whose solution depends the widespread introduction of the credit system.

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## RAIL SYSTEMS

### ACHIEVEMENTS OF ELECTRIC LOCOMOTIVE BUILDING INSTITUTE

Moscow ELEKTRICHESKAYA I TEPLOVOZNAYA TYAGA in Russian No 11, Nov 83 pp 14-18

[Article by B.A. Tushkanov, chief project designer, VEINII: "Designers' Creative Search"]

[Text] In the 25 years of its existence, the All-Union Scientific Research, Planning-Design, and Technology Institute of Electric Locomotive Building, (VEINII), has become the leading scientific center determining the technical level of domestic locomotive building. Institute specialists, working in close cooperation with the collective from the Novocherkassk Electric Locomotive Plant (NEVZ) continually conduct an intensive creative search and introduce progressive technological solutions in the designs of electric locomotives. This enables constantly increasing requirements of the railroads for traction parameters, reliability, power and other operational characteristics in mainline freight electric locomotives of both alternating and direct current types.

In those 25 years, approximately 25 types and versions of electric locomotives have been developed by the institute for use on USSR railroads, in Finland (Srl), and Poland (ET42), with 19 of those in series production at NEVZ. The electric locomotives VL80T, VL80S, VL80R, Srl, ET42 and traction components OPEI for industry were awarded the State Mark of Quality, and for the development, series production, and operation of the VL80T electric locomotives, a group of employees from VEINII, NEVZ, MEI (Moscow Power-Engineering Institute), and the MPS (Ministry of Railways) was presented the titles of USSR State Prize Laureates.

Main parameters and technical characteristics of basic versions of the electric locomotives are presented in table 1. These data reflect a continual upgrade in traction properties and an improvement in electric locomotive characteristics.

Since the Sixties and Seventies, with a number of Scientific Research Institutes and plants participating, scientific research and experimental design work has been underway to employ non-commutator traction engines and regulated frequency, single-phase current thyristor converters. This work produced electric locomotives with converter (synchronous) traction engines (VL80VD-661 in 1970, 1129 and 1130 in 1976), and with asynchronous (VL80A-751 in 1971) which underwent a complete range of research and testing, including actual use conditions.

Work is underway presently relating to the results of this research. It is being retarded, however, by insufficient progress on the part of industry to establish the manufacture of thyristors, diodes, capacitors, and electronic elements having performance parameters and reliability required for converters and control systems for locomotives of this type. In 1985, plans call for the production of an experimental prototype 12-axle mainline freight electric locomotive with asynchronous traction engines.

A significant stage in locomotive building was the creation and production of the first domestic thyristor alternating current electric locomotive with regenerative braking, the VL80R, which, in parameters and technical characteristics, is superior to foreign counterparts (Table 1). Use of VL80R electric locomotives permitted the return to a contact system in 1981 of 55.6 million kilowatt hours, and in 1982 of 73.7 million kilowatt hours.

Excellent testimonials regarding the operation of export 4-axle electric locomotives of the Sr1 alternating current type in Finland (illustration 2) (table 1) and of the 8-axle, direct current ET42 electric locomotives in Poland bear witness to the high technological level and quality of their production.

In 1982, a standard type of mainline electric locomotives developed by the MPS and Ministry of the Electrotechnical Industry was certified, a type which will define for the near term the production range, basic performance parameters, and technical characteristics for electric locomotives. It will permit the planning of developmental, experimental, research, and production bases for electric locomotive building and associated sectors, the suppliers of major electric equipments, with minimal risk of extensive reconstruction of production for the foreseeable future.

Two experimental 2-section 12-axle VL85 alternating current electric locomotives were produced during the first half of 1983 according to this standard (see illustration 3). Those models are presently undergoing testing. The power of the electric locomotive with an hourly rating of 10,000 kilowatts and tractive force of 72 ton-force exceed performances of the series produced VL80S and VL80R by 1.53 with a concomitant substantial reduction in per unit expenditures of design materials.

The increase in traction performance of alternating current electric locomotives over the past 20 years is graphically represented by the common traction characteristics of the VL60K, VL80R, and VL85 locomotives (illustration 4).

In the establishment of production at the NEVZ of 8-axle direct current VL10 electric locomotives, developed by the TEVZ (Tbilisi Electric Locomotive Plant) Design Bureau and based on the VL80 locomotive underframe unit (1969-1981), the VEINII actively participated in improving designs of a number of this locomotive's subassemblies.

The institute is also participating in the creation of the 12-axle 2-section direct current VL15 electric locomotives, the development of which is being carried out by the Electrovozostroitel' Production Association to ensure maximum unitization of subassemblies and underframe unit with the VL85 locomotive.

Specialists from VELNII created a powerful traction unit of alternating current type for open pit use, the OPE1, consisting of three 4-axle traction units: electric locomotive, diesel, and a motorized dump car. Series production of these traction units has been established at NEVZ.

We will examine the design execution of the locomotives in greater detail.

Locomotive underframe unit. Design of the underframe for the VL80 series of 8-axle locomotives, having an axle formula of  $2(2_0-2_0)$ , was created with allowance for the results of comprehensive tests and operational experience with welded-cast truck frames and rubber components in locomotive underframe axle box assemblies, first used in domestic locomotive building in the VL60. Thanks to this and the simplicity of design for the 2-axle pivot trucks, a high level of reliability was insured for the underframe beginning with the first VL80 electric locomotive experimental prototypes.

In developing the design, only the body mounting assembly for the truck was changed. To improve dynamics and underframe servicing conditions, the lateral spring mounts were replaced by bar suspensions.

A new stage in the development of the electric locomotive underframe was the creation of the unitized non-pivot 2-axle trucks with transmission of tractive force to the body frame via oblique push-rods. These units, compared to pivot-types, are less metal intensive and improve the utilization of the locomotive's coupling weight. Such trucks are used as unitized elements for 8 and 12-axle electric locomotives and are used on the Sr1, VL84, VL85, and VL15 locomotives.

With VL85 and VL15 electric locomotives with axle formula of  $2_0-2_0-2_0$ , a middle truck is mounted under the 6-axle section, having great lateral travel, and equipped with a swivel body-to-frame mounting rod system. VL84 experimental locomotives are undergoing operational testing of an institute developed traction transmission for the support-frame engine suspension.

Electrical machinery. A major success of the institute's designers and researchers is considered to be the creation and design development of pulsating current traction engines. Because of adverse motor commutation conditions for motors fed by rectifiers on alternating current electric locomotives, a compensating winding is used and a number of special approaches were employed in designing the magnetic system. Primary technical specifications for traction engines developed by VELNII and built by NEVZ are provided in Table 2.

Major approaches implemented during the process of creating new traction engines or in improving series engines include the following design features:

- "F" class heat resistant insulation having high heat conductivity and temperature resistance;
- EG-61 type electric brushes having a low coefficient of friction and permitting current density of up to  $13 \text{ A/cm}^2$ ;
- insulated winding wire;
- commutator profile copper with increased hardness to 100 N;
- rolled electric transformer steel of 2212 type with improved magnetic properties.

Electrical circuits.

The late Fifties and Sixties were characterized by advances in the development of power semiconductor devices--powerful diodes and thyristors, and also of control systems with magnetic amplifiers and electronics. Therefore, along with efforts to perfect the VL60 ignitron-based electric locomotive circuits, the institute, collaborating with a number of organizations, conducted scientific research and experimental design work on the use of semiconductor converters in lieu of ignitron types. As a result, silicon diode rectifiers were installed in the VL60 and VL80 electric locomotives. These locomotives were assigned the designators VL80K and VL80K.

The power circuit adopted for these locomotives--two "bridges" each feeding a group of three (VL60K) and a pair (VL80K) of parallel connected traction engines, was marked by simplicity and preserved the VL60 and VL80 voltage regulation system supplying the rectifier by switching line taps from the transformer's secondary windings using an EKG-8 group contactor with converter reactor. As a result, the changes introduced in the designs for the VL60 and VL80 locomotives were held to the minimum, which permitted series production to be set up for these locomotives in a very short time.

The capability of phased voltage regulation through the use of controlled rectifiers, which was achieved after ignitrons were perfected and the manufacture of powerful thyristors by industry, enabled alternating current electric locomotives to be equipped with regenerative braking systems.

After an extensive program of research and design development by scientists and specialists, a large number (85) of the VL60R ignitron electric locomotives with regenerative braking systems was produced. The locomotives underwent testing successfully and for an extended time were in conventional operation in the mountainous sections of the Far East and Eastern Siberian Railroads.

The power circuit of the VL60 electric locomotive was preserved practically without change. It was augmented by a ignitron regulating rectifier feeding the series-connected exciter windings of six traction engines, stabilized by resistors and high-speed automatic switches installed in the armature circuit of each traction engine, and also by additional equipment operating in the switching circuit during switching from the traction mode to the braking mode. The ignitron control circuit was supplemented by special electronic equipment which controls the open phase of the ignitrons, and also automatically maintains a constant Delta reserve angle during changes in traction engine current and reactive resistance of the contact system.

Successful experience with the creation and building of the VL60R locomotives facilitated undertaking the development of the 8-axle thrystor electric locomotive with regenerative braking and to produce in 1967 the first mock-up of the VL80R electric locomotive. In subsequent years, a major run (120) was produced, and in 1979, series production of these locomotives was begun. Concomitant with the production of experimental units, the circuitry and design of main assemblies, the thyristor converter and the electronic control system, were being developed. This enabled extensive experience to be gained by the

Table 1. Electric Locomotive Parameters and Technical Specifications

Specifications	Type of Locomotive							
	VL60	VL60K	VL80K	VL80M	VL82M	VL80T	OPEI	StL
(1) Год начала серийного производства	1959	1965	1964	1965	1966	1969	1970	1974
(2) Род тока	25 кВ, 50 Гц	25 кВ, 50 Гц	25 кВ, 50 Гц	25 кВ, 50 Гц	25 кВ, 50 Гц	3 кВ постоянн.	3 кВ постоянн.	1975
(3) Осьевая формула	3...—3... <sub>4</sub>	3...—3... <sub>4</sub>	2(2...—2... <sub>4</sub> )	1979				
(4) Конструктивная масса, т	138	138	138	138	138	200	186	1980
(5) Мощность чистового ресурса на вакуумных тяговых агрегатах, кВт	4140	4590	6520	6910	5360	6520	6114	5520
(6) Сила тяги чистового ресурса, кН	32,0	31,86	45,1	31,86	42,4	39,5	45,1	45,1
(7) Скорость чистового ресурса, км/ч	46,6	52,0	51,6	52	51,0	48,7	51,6	51,6
(8) Конструктивная сноска, кН/км	100	100	110	100	110	110	110	110
(9) Тип тягового двигателя	НБ-412М	НБ-412К	НБ-418К6	НБ-412К	НБ-407Б	ЛБ-2КИ	НБ-418К6	НБ-418К6
(10) Тип подвески тягового двигателя	одноподвес.	одноподвес.	одноподвес.	одноподвес.	одноподвес.	одноподвес.	одноподвес.	одноподвес.
(11) Давление в шине, кПа	—	—	—	—	—	—	—	—
(12) Электрическое торможение	—	—	—	—	—	—	—	—
(13) Способ регулирования тягового агрегата	ступенчатый	ступенчатый	степенный	степенный	степенный	степенный	степенный	степенный
(14) Напряжение тягового агрегата	ИВК-300/6	ИВК-60	ИВК-400/6	ИВК-500/5	ИВК-670/6	—	ИВК-400/6	ИВК-400/6
(21) Тип преобразователя	—	yes	—	—	—	—	—	—
(22) Возможность работы по системе многих единиц	—	—	—	—	—	—	—	—

• Power rating at 60 kph

- 1 - Year series production began
- 2 - Current type
- 3 - 3 kV direct, 25 kV alternating
- 4 - Axle formula
- 5 - Design weight
- 6 - Hourly rating at traction engine shafts, kW
- 7 - Hourly traction force, ton force
- 8 - Hourly speed, kph
- 9 - Design speed, kph
- 10 - Type of traction engine
- 11 - Traction engine suspension type
- 12 - Support-axle
- 13 - Support-frame
- 14 - Type and rating (kW) of electric traction
- 15 - Regenerative
- 16 - Rheostatic
- 17 - Method of traction engine voltage regulation
- 18 - Stepped
- 19 - Contactor-rheostat type
- 20 - Continuous
- 21 - Type of converter
- 22 - Capability for operation in multi-unit system

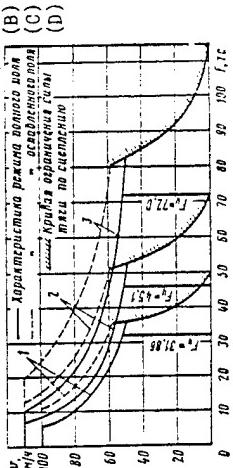


Illustration 4. Traction engine characteristics  
(B) - Full field mode characteristics  
(C) - Reduced field mode characteristics  
(D) - Rheostatic mode characteristics  
1 - VL60K 2 - VL80R 3 - VL85

Table 2. Technical Data for Traction Engines

Type	(1) H.P.	(2) Tons. A	(3) Nominal current, A	(4) Nominal voltage, V	(5) Nominal power, kW	(6) Nominal speed, r/min	(7) Nominal torque, Nm	(8) Nominal current, A	(9) Nominal voltage, V	(10) Type of suspension	Electric Locomotive	Remark <sup>4</sup>
DPE-400	400	3000	280	710	1980	70	1050	4.05	1848	onoph.-ocess	VL22M	Developer - "Dinamo" Plant
NB-412K	775	1600	515	850	1680	110	4600	2.72	1963	*	VL60K, VL60R	
NB-406	525	3000	380	735	4100	95	8160	4.17	1956	*	VL8, VL23	
NB-418K6	790	950	880	890	2040	105	4076	2.26	1966	*	VL80K, VL80T, VL80S, VL85	Engine installed in first two experimental electric locomotives developed - P.O. "Elektrovozostroitei," Special Design Bureau
TL-2K1	670	1000	480	790	1650	95	4750	3.31	1969	onoph.-ocess	VL10, VL10U, VL11	
NB-412P	575	1100	565	570	1250	6800	110	4600	3.65	1970	*	OPEI
NB-407B	755	3000	535	760	5300	85	4675	2.87	1972	*	VL82M	
NB-501	840	1000	875	940	3900	110	3400	2.21	1974	onoph.-ocess	SRI	
NB-508A	605	3000	435	775	1763	775	4020	85	1976	onoph.-ocess	YET42	
NB-507	950	1050	940	730	1500	6000	95	4600	2.31	1979	onoph.-pulsan	VL84
NB-514	835	980	905	905	2040	95	4075	2.16	1984	onoph.-ocess	VL85	

<sup>5</sup>Weight of traction engine given with no allowance for motor and axle bearing caps and bushings

<sup>1</sup> - Hourly rating, kW

<sup>2</sup> - Nominal voltage, V

<sup>3</sup> - Nominal current, A

<sup>4</sup> - Speed of rotation, hourly/maximum, rpm

<sup>5</sup> - Hourly traction force to axle, kilogram force

<sup>6</sup> - Volume of cooling air, m<sup>3</sup>/minute

<sup>7</sup> - Weight, kg

<sup>8</sup> - Unit expenditure of materials, kP/kW

<sup>9</sup> - Year series production began

<sup>10</sup> - Support-axle

<sup>11</sup> - Support-frame

collector of simplified design, and subsequently, the L-13U(14M1), a group switch designated the EKG-8 for transformer line taps, the successful design of which allowed the use of a more economical system of low voltage voltage regulation on domestic alternating current electric locomotives. After the creation of strip design resistors with intensive ventilation, the LF type, VL80T locomotives were equipped with powerful rheostatic brakes.

The VEINII developed a series of standardized MK-type electromagnetic contactors, RP-type electromagnetic relays, and KE-153 contactor elements, the use of which improved the reliability of electrical apparatus. Original designs, executed at a high engineering level, include also the RS-type leveling reactors with open magnetic circuits and radial arrangement, and the VB-021 high-speed, small-scale automatic switch.

For complex control systems for rheostatic brakes and thyristor converters, electrical apparatus had to be created with extensive use of electronics. Such apparatus was developed for the VL80S (BURT), VL80R (BUVIP), and VL10U (SAURT) electric locomotives.

Functional assemblies, structures, and apparatus overall were developed both on bench, under all mechanical and climatic effects with simulated operational and extreme conditions as well on electric locomotives, under actual operating conditions. In apparatus of the latest modifications, broad use of microelectronics has been incorporated, as are designs which have undergone extensive operational testing. The control apparatus for the VL80R electric locomotive BUVIP-125 thyristor converter is shown in illustration 5 as an example.

#### Installation, equipment configuration, and ventilation system.

In creating new electric locomotives of the alternating current type, designers were faced with improving adaptability of locomotive installation, and to reduce volume of operations during their final assembly. At the same time, it was necessary to reduce the expenditure of circuit wiring, improve servicing conditions for equipment in service, fulfill sanitation requirements, safety considerations, and for the operators' cabin, ergonomic and aesthetic factors.

To carry out these tasks, a configuration was adopted for electrical equipment featuring autonomous installation units of optimal size, and aluminium bus installation was used instead of wire. Broad experimentation was conducted in VL60 electric locomotives at the beginning of the Sixties with the use of aluminium rolled busbars instead of copper, accompanied by the thorough development of tin-plating contact surfaces. This permitted the establishment of series production for aluminium busbars for all types of electric locomotives. As a result, hundreds of tons of scarce copper roll are saved annually.

Configuring the equipment in removable units also provided for improved service and repair conditions at depots and repair plants. Much has been done to improve comfort and the interior of the operators' cabin. The cabin on new electric locomotives has been expanded and air heaters are now employed. The operators' control panel and work space have been configured in accordance with contemporary ergonomic requirements and technical aesthetic considerations

illustration 6, and provisions have been made for the installation of air conditioning.

Because of increased locomotive power and heightened requirements to protect electrical equipment from environmental effects, a ventilation system for electric locomotives has been perfected. Increased reliability and economy of fans, improved aerodynamics of conduits, collector and distribution devices, improved fan equipment, development and production of labyrinth shutters, which effectively cleanse the air of moisture, fan-dust separators, ventilation system with partial recirculation of cooling air under winter conditions--this is far from a complete listing of the work done by designers and institute research workers in this field. Presently, a regulating drive for fans is being created for electric locomotives of alternating and direct current types, which will provide for a significant reduction in power expenditures for fundamental needs.

The experience of VELNII operations over the past 25 years permits a confident statement that its collective will successfully cope with the very important tasks posed for electric locomotive builders which relate to the expanded electrification of railroads and the continuous growth in transportation of national economic cargoes.

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## PORTS AND TRANSSHIPMENT CENTERS

### PORt PERFORMANCE WRAP-UP FOR APRIL 1984

Moscow VODNYY TRANSPORT in Russian 24 May 84 p 2

[Editorial: "Accelerate Movement of Freight"]

[Text] Transportation centers fulfilled 101.5 percent of the April transshipment plan and 103.4 percent of the 4-month plan. High results were achieved by the transport workers of Arkhangelsk, Ventspils, Skadovsk, Sevastopol, Baku, Makhachkala, Krasnovodsk, Poset, Ugleorsk, Korsakov and Petropavlovsk. However, many major transportation centers of the Baltic, Estonian and Georgian steamship companies operated below planned goals. According to the results of the four months, Murmansk, Leningrad, Kaliningrad, Poti and Termez have indicators below the plan.

In the export direction, 1.23 million tons more have been sent from ports since the beginning of the year and 3 million tons less import freight has been unloaded from ships than during the same period last year. Rail cars were being delivered to the ports for import freight at a level of 90 percent of the plan.

At some ports export freight is stored for over 3 months (Kaliningrad, Leningrad, Tallinn, Odessa, Ilichevsk, Kerch, Berdyansk, Novorossiysk, Izmail and Baku).

Transportation centers eased up on shipment of old import freight in April. Its amount was reduced by only 25,000 tons, and in return the remaining freight with storage dates of over 1 and 3 months increased. Consignee-enterprises' appeals for timely shipment of individual batches have become more frequent. Deserving of reproaches in this are the suppliers of Arkhangelsk, Murmansk, Kaliningrad, Ventspils, Nakhodka, Vladivostok and Vanino.

The plan of total rail-car loading in April for all transportation centers was underfulfilled by 5,000 cars and for overall unloading--by 3,200 cars. In 4 months ports did not receive 24,000 cars for loading and 14,400 cars for unloading. The fine work of the Northern, Dnieper and Far East rail lines with seaports must be noted. Interaction with rail transport workers improved at the Leningrad Transportation Center in April and May. The Donets Line fulfilled the overall plan for unloading for Zhdanov, but fell short in loading.

In Riga, where the regional transportation center operates with participation of the Latvian Maritime Steamship Company and the Baltic Rail Line, they are unable to regulate rolling stock for fulfillment of plans for rail cars. Fact remains fact--the Riga Transportation Center is supplied with rail cars worse than all others in the zone of the Baltic Rail Line. In 4 months 3,400 cars were not delivered for loading and 1,500 for unloading. Ships with grain and highly perishable cargoes continuously lay idle. The port is actively being developed and such an attitude toward the use of its capacities cannot be tolerated anymore.

The Poti Transportation Center plays an important role for the national economy of the Transcaucasian republics. However, administrators of the Georgian Maritime Steamship Company and the Transcaucasian Rail Line have lost the taste for well-coordinated work. The lack of efficient activity by the regional transportation center has led to a worsening of indicators: in 4 months the loading plan was underfilled by 4,000 cars and the unloading plan by 420 cars and in April, by 1,150 and 850 cars respectively. In a month 1,500 cars have been lost for transshipment freight alone. The situation with transient shipments must be corrected immediately.

In the first quarter, according to the ministry, the quality indicators of fleet processing improved considerably at the ports. Compared with the first quarter of last year, the gross intensiveness increased by 11.9 percent, with an annual goal of 3.1 percent, and the waiting time was reduced from 37.5 percent to 31.7 percent, with the amount of processed ships increasing by 200 units. However, the results of ship processing decreased at Leningrad, Izmail, Vladivostok and Nakhodka. At Magadan the gross intensiveness remained at last year's level, but it must be remembered that the goal for growth of intensiveness here was the largest--15 percent. The steamship companies bear direct responsibility for the increase of gross anchorage time, backing up ships at the ports, especially in waiting for the arrival of export freight. On the whole, the question of observing schedule discipline remains pressing; actual schedule fulfillment of fleet delivery schedules to the ports shows that only a third of the ships arrive at the designated time, with deviations ranging in days.

For transportation centers supporting shipments to points in the Arctic, the most crucial time is coming. Pre-navigational delivery of freight to port-consignors must be completed as soon as possible. Although the accumulation is going at a higher level than last year, it is lagging far behind the USSR Gosnab quota. Taking into account the experience of last year, a partial re-dispositioning of freight traffic for the Eastern Arctic to the ports of Arkhangelsk, Murmansk and Leningrad has been done. The USSR Gosnab must take effective measures to ensure the arrival of freight in the planned amount.

Large volumes of shipping are imminent in the Far East, just as in previous years. It is necessary to ensure freight delivery to Magadan, Sakhalin and Kamchatka. These shipments are accomplished at the beginning of the year, but it is already apparent that there is a delay in shipping on the Magadan route now. Freight is being poorly hauled from the port by motor transport workers.

Over 2,000 units of wheeled equipment are backed up at Vladivostok and Vanino. Shipment of it to Magadan and Petropavlovsk is going slowly. The role of the operational coordination group, established by decision of the board and headed by chief of the DVMP [expansion unknown] Yu. Vol'mer, is not apparent. Already today over 500 cars have accumulated at Vanino for Magadan and the port's warehouses have accepted 26,000 tons of freight. Serious coordinated measures are needed on the regional transportation center scale and at port transportation centers.

In May and June longshoremen and rail transport workers with the assistance of motor transport workers have to ensure shipment from the ports of a considerable amount of cotton, perishable cargoes and metals, mainly for agricultural and motor vehicle machine building. The arrival of five ships with cotton is expected during the third week of May. Experience shows that the ports waste a lot of time on fumigation and do not prepare two ships simultaneously. At present, over 35,000 tons of perishable cargo have accumulated at Baltic ports, but the flow of rail cars is supplying less than half the orders. There is a similar situation with metals. Without serious help on the part of the Ministry of Railways on boosting freight shipments from the Baltic and active work of the Baltic Transportation Center, the accumulation of ships and freight at the Baltic ports can remain for a long time.

In June the transportation centers must accelerate the movement of freight, reduce residual freight and ship out all extended storage freight. Along with the capabilities of the railroads, all the transport resources of river and motor transport must be actively used.

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## PORTS AND TRANSSHIPMENT CENTERS

### PORt CHIEF ON TOMSK PORT OPERATIONS

Moscow RECHNOY TRANSPORT in Russian No 3, Mar 84 pp 6-7

[Article by P. Drachev, chief of the Tomsk Port: "In The Tomsk Transport Terminal"]

[Text] The Tomsk Industrial-Transport Complex plays an important role in bringing the West Siberian oil and gas deposits into production. The complex includes the Tomsk River Port, the Oblast Motor Vehicle Transport Administration, the Tomsk-Gruzovoy Station and 19 organizations that receive and ship freight.

The activities of all the participants in the complex are coordinated by a staff of enterprise managers headed by the deputy oblispolkom director and by a coordinating council.

In order to increase the efficiency and quality of river port operations, the management structure was reviewed. The Tomsk Rayon Administration, an unnecessary link, was eliminated and most of its functions transferred to the Tomsk Port.

The creation of the industrial-transport complex facilitated a significant growth in the volume of transshipments. The group operation method was widely implemented among ship crews. Large tows were successfully transported along main rivers.

The central link in the industrial-transport complex is the Tomsk Port, which handles about 70 percent of the West Siberian Shipping Company's total transshipments. The Motor Vehicle Transport Administration and the Tomsk-Gruzovoy Station handle a large amount of freight. These are the basic links in the transport conveyor which provide intra- and inter-oblast shipments.

The transport enterprises are working to make the freight flow more efficient, develop express shipments and organize freight containerization and packaging. These steps have reduced freight transport costs and increased the motivation of shippers and receivers.

Before the complex was created, data were collected from each enterprise on the power and capacity of available means of transport, the traffic capacity of berths, the lifting capacity of transfer machines and on storage areas.

flows were studied according to the type of freight: shipping seasons were also studied, showing volumes, points of origin and destinations, shippers, receivers and shipping distances.

On the basis of this information, calendar plan/schedules are made up for the related entities. Special attention is given to coordinating the operations of different forms of transport at connecting and transshipment points. While coordinating the operation of the links, a systematic analysis is made of which form of transport to use. A working group of the coordinating council directly organizes the daily coordination of planning.

All of these measures have made it possible to increase the efficiency of transport operations and to more fully satisfy the shipping demand of the oblast's economy. Over the 10th Five-Year Plan, the volume of transshipments nearly doubled. Since 1982, the main index, according to the approved statute of the Tomsk Industrial-Transport Complex, is the reduction of shipping time, broken down by nomenclature and by freight receiver.

Despite last year's difficult conditions, the industrial-transport complex handled 19 million tons of freight and was declared the best in the republic. The complex's enterprises received diplomas from the All-Union Central Trade Union Council and the top monetary prizes. On the basis of socialist competition within the industrial-transport complex, the Tomsk Port won first place and was awarded the challenge Red Banner of the CPSU Okbom, Oblispolkom, Oblsovprof and of the Komsomol Obkom.

In 1983, the freight transshipment plan for small rivers was overfulfilled by a factor of 1.5. The coordinating council brought in the small-tonnage fleet of the complex's enterprises to operate on especially difficult rivers which had not previously been navigated.

The competition between associated enterprises has helped remove barriers between institutions and develop a feeling of mutual responsibility in providing transport service to the oblast's economy and population. Among the transport terminals of West Siberia, the Tomsk complex was awarded first place and given the challenge Red Banner. The freight transshipment plan was overfulfilled, while average freight car demurrage decreased by 0.7 hours; average vessel demurrage was reduced by 160 tonnage-days and labor productivity increased by 17 percent. Large-diameter pipe was delivered on time from the ports of the Far-East Maritime Shipping Company for the Urengoy-Pomary-Uzhgorod pipeline. Essential help in this task was provided by the complex's associates, the Tomsk-Gruzovoy Station and the Tomskneft' Association, which lent their storage facilities and freight handling equipment to the port.

By partially switching cement from rail to river transport (with transshipment through Tomsk), it was possible not only to eliminate difficult manual labor, but also to free a large number of rail cars for other freights. The business-like cooperation between the collectives of the Tomsk Industrial-Transport Complex has increased the responsibility taken for joint operations. A distinctive feature of socialist competition in navigation in 1983 was the mobilization of the collectives' forces to, above all, fulfill the common overall index for the entire complex.

At present, all the participants in the competition, with the aid of scientists from Tomsk State University, have made a plan for economic and social development of the complex for the period 1984-1990.

However, there are difficulties on the path of further development of cooperation between the associates.

There has been wide discussion in the industry's press (RECHNOY TRANSPORT, 1983, Nos. 7 and 8; MORSKOY FLOT, 1983, Nos. 7 and 9; ZHELEZNODOROZHNY TRANSPORT, 1983, No. 7) on questions of cooperation between transport organizations. Also discussed were ways to create a system which would, organizationally and economically, orient transport organizations toward achieving the end economic result: delivering the required volume of freight within the agreed time period in accordance with the plan products list.

The problem of transport organization interaction within transport terminals was considered and discussed in detail in May 1983 at a round-table discussion in Illichevsk. The discussion was conducted by the editors of MORSKOY FLOT, RECHNOY TRANSPORT, ZHELEZNODOROZHNY TRANSPORT, AVTOMOBIL'NYY TRANSPORT and VNESHNYAYA TORGOVLYA magazines. There was wide participation by the administrators of union and republic transport ministries; all types of freight-carrying enterprises and representatives of planning, party and trade-union organizations. These same problems were raised in the article "Transport--The Cooperation of Associated Organizations," published in the 18 November 1983 edition of SOVETSKAYA ROSSIYA newspaper.

In support of the statements of the industry's and the central press, one wants to believe that in the near future, identical indices and normative documents, criteria and incentives will be implemented for all transport organizations. One also hopes that the organizational-legal structure will be improved.

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## POR TS AND TRANSSHIPMENT CENTERS

### OPERATIONAL IMPROVEMENTS AT CHEREPOVETS PORT

Moscow RECHNOY TRANSPORT in Russian No 3, Mar 84 p 8

[Article by V. Kolykhnovskiy, chief economist of the Cherepovets Port: "The Effect of Labor Cooperation"]

[Text] A system of organizing the handling and complex servicing of the transport fleet has been developed at the Cherepovets Port. The system has significantly reduced handling times and saved 1.4 million tonnage-days in 1982 and around 2 million tonnage-days in 1983.

The restructuring of the operational management of the Northwestern Shipping Company's enterprises had a great influence on the improvement of handling and complex servicing of the fleet.

In 1980, the port chief was given all the management rights over the Cherepovets river enterprises, including the shipbuilding and ship-repair yard. At the same time, he is deputy chief of the Northwestern Shipping Company and heads the council of directors, the functions of which are determined by the statute approved by the shipping company.

A partkom of the Northwestern River Shipping Company was formed in Cherepovets. Subordinate to it are the partkoms of the port, shipbuilding and ship-repair yard and all party organizations of river enterprises. The Komsomol organization has a similar structure.

These and other measures make it possible to coordinate the activities of all enterprises and to direct their operations toward transshipment growth, improvement of fleet use and reduction of demurrage.

There have been improvements in fulfilling organizational and technical measures in the following areas: 1) speeding fleet handling; 2) improving its complex servicing; 3) reducing the time needed for river-bed repairs and 4) improving the radio-navigation, medical, cultural and other services.

Public organizations have given important help in solving these problems.

The partkom of the river transport terminal periodically reviews, at joint meetings with the railroad terminal partkom, problems of port and railroad terminal operations. This is in accordance with the method of the Leningrad transport organizations.

The trade union committee administrators, together with the port administration, calculate the results of socialist competition between the collectives of their own enterprises and the associated transport organizations.

Monthly meetings between the port chief and the organizations which have their own docks have played a big role in reducing ship handling times. These meetings were recommended by the Industrial-Transport Department of the Cherepovets CPSU Gorkom. As a result of the meetings, specific actions are taken and implementation deadlines are determined.

The port makes a daily plan of vessel handling and complex servicing. Loading and unloading is done, as a rule, with two or more cranes. Complex servicing is generally done during freight handling. The results of fulfilling the tasks of fleet handling and complex servicing are reviewed at a dispatchers conference.

Unfortunately, the port workers have not been able to get precise information on vessel arrivals, especially motor vessels loaded with ore from the Volga-Don. Another problem is receiving complex service requests from captains far enough in advance. During the 1983 shipping season, there were instances where ships of the White Sea-Onega Shipping Company could not sail due to incomplete crews. Other ships were delayed because of a lack of fuel at the Volgatanker Shipping Company fueling base.

It should be noted that the Cherepovets Port has completely overcome the problem of vessel delays due to the railroads failing to deliver the planned freights for transshipment. This was achieved by the coordinated work of the port with the collectives of the Northern Railroad and the shippers: Pecheruglesbyt and Komilesprom.

The mutual cost-accounting relationship between the port and the Northwestern Shipping Company has had a great influence on the fulfillment of time norms for fleet handling. For each tonnage-day of freight motor vessel demurrage, the port pays the shipping company a fine of 50 kopecks. The port receives 25 kopecks in dispatch money from the shipping company per tonnage-day.

The average time norm for transport fleet handling is a necessary condition for giving bonuses to management and engineering and technical personnel. The dispatcher staff is given additional bonuses for reducing fleet handling and complex servicing times. Port workers of consolidated direct complex brigades and floating crane crews get bonuses for reducing freight handling norms for railcars and vessels.

In order to provide greater stimulus for port workers to handle vessels more quickly, we believe that it is necessary to establish time norms for periods of several years.

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## INTERSECTOR NETWORK DEVELOPMENT

### TRANSPORT CONSTRUCTION MINISTER ON 1984 PLAN GOALS

Moscow TRANSPORTNOYE STROITEL'STVO in Russian No 4, Apr 84 pp 1-3

Article by I. D. Sosnov, USSR minister of transport construction; deputy, USSR Supreme Soviet candidate-member, CPSU Central Committee; hero of socialist labor: 'State Plan and Branch Tasks!'

Text A large-scale program of capital construction is being fulfilled in all branches of the national economy.

Transport builders are making a substantial contribution to development of the economy. In accordance with the general contract the plan of construction-installation work for 3 years of the five-year plan was fulfilled 100.7 percent and, with the use of our own forces and resources, 101.3 percent. During this time 1,565 km of new railroad lines and 2,475 km of second lines were built and put into operation, 2,960 km were electrified, and 6,840 km of railroad main lines were equipped with automatic block signaling. Considerable work was fulfilled on the construction of highways, bridges and subways and on the development of maritime and river ports.

Through wide development of socialist competition for ahead-of-schedule fulfillment of targets of the 11th five-year plan, in 1983 the transport construction workers ensured 101.3 percent fulfillment of the plan of construction-installation work on the general contract and, with use of our own forces and resources, 101.7 percent. In comparison with the level of 1982, the volume of work fulfilled showed an increase of 87 million rubles, or 2 percent. In this connection the plan of contract work for the Ministry of Railways and Ministry of the Maritime Fleet was fulfilled and our own plan of capital investments of the Ministry of Transport Construction was overfulfilled.

The total area of housing turned over for use constituted 103 percent, including 104 percent for railroad workers and 105 percent for transport construction workers. Targets were met on the turnover for use of vocational and technical schools, hospitals and polyclinics.

The collectives of builders of the Baykal-Amur Main Line BAM, where, despite difficult natural-climatic conditions the state plan is being fulfilled at higher rates than for the ministry as a whole, deserve a high appraisal. Thus, the plan for BAM construction in 1983 was fulfilled 113 percent.

There was 105 percent fulfillment of the annual plan of construction-installation work on construction projects of paramount state importance.

In 1983 work fulfilled by organizations of the Ministry of Transportation on development of the transportation system of the West Siberian oil and gas region amounted to 100.2 percent and on construction projects of the Eki-bastuz fuel and power complex, 104 percent. A great deal of work was performed on projects of the Kansk-Achinsk fuel and power complex.

At the same time, there were substantial shortcomings in the work of the Ministry of Transport Construction in 1983: of 155 associations and trusts, 65 failed to fulfill the general-contract plan and 53 organizations did not fulfill the plan for utilization of their own resources. Here trusts with an approximately equivalent structure and situated practically under the same conditions showed different work results. Thus, the Dnepr and Donbass transport construction organizations work side by side under identical conditions in the Main Administration for Railroad Construction in the Volga Region and the South. The former had 106 percent plan fulfillment, but the latter, only 85 percent.

Unfortunately, this is not an isolated example.

It is necessary to be deeply conscious of the fact that plan fulfillment depends directly upon the level of management, the state of labor and production discipline, and the ability to make efficient use of equipment, transportation and material resources, i.e., to organize work competently and in great detail.

It is essential to state that although the plan for the Ministry of Railways was fulfilled as a whole, we are 50 million rubles in arrears for projects on the operational network. There was no basic change in the state of affairs with respect to fulfillment of construction-installation operations for the RSFSR Ministry of the River Fleet; the lag for the year amounted to 7 million rubles. The plan of contract work for the Ministry of Civil Aviation was also underfulfilled.

There must be a decisive improvement of work on fulfillment of targets for transport ministries and measures must be taken not only for plan fulfillment but also for maximum compensation for the lag. The same conclusions should be drawn also for the construction projects of our own production base. In view of a shortage of resources, we had only 98 percent fulfillment of the annual plan of our capital investments for its development and for housing and cultural-services construction.

The chiefs of main administrations and trusts still do not study sufficiently problems of the technical reequipping of their enterprises, oriented toward the production of advanced structures and materials which increase labor productivity, and do not work out fully problems of organization of the production of output in operational production areas.

It was emphasized in the decisions of the 26th Party Congress and decrees of the November (1982) and December (1983) Plenums of the CPSU Central Committee that the growth of labor productivity is a decisive condition for further development of the national economy of the country.

Unfortunately, this requirement has still not become a determining factor in the activity of many of our leaders. Out of 145 trusts, 104 (72 percent) failed to meet targets, including 49 (34 percent) which were below the 1980 level in this respect. The unconditional fulfillment of established targets for an increase in labor productivity must become the chief task for each main administration, trust, construction-installation organization and industrial enterprise.

The measures implemented for the mechanization of labor-intensive operations, improvement of technology and an increase of the level of construction industrialization, and the development and introduction of highly productive new machines for transport construction enabled us to achieve the lowest relative proportion of manual labor among construction ministries in the current five-year plan. During the past 5 years machinery available per branch worker increased 1.8-fold and the power-worker ratio, by a factor of 1.3. However, this did not produce the desired results in the pursuit of increased labor productivity.

The main cause of such a situation is apparent in the unsatisfactory work of trusts for improvement of the organization of production, labor and management. Intrashift losses of work time for the ministry as a whole not only were not reduced but increased in comparison with data of the 10th five-year plan, constituting 8 percent in 1983 as opposed to 6.5 percent in 1980.

The intrashift downtime of machines increased from 11.6 percent in 1980 to 14.5 percent in 1983. In the majority of construction organizations the machine shift coefficient has not been increasing in recent years and in 1983 it even dropped to 1.24 as against 1.5 in 1980. In the past year there was an overexpenditure of gasoline. An especially large amount of fuel was consumed during the utilization of truck transportation by main administrations for railroad construction in the Urals and Siberia and in Kazakhstan and Central Asia and Glavzapsibdorstroy [Main Administration for Highways Construction in West Siberia and the Urals].

Since the start of the five-year plan there has been a deficit in the saving of labor input amounting to 2.8 million man-days due to a deterioration in the utilization of construction equipment.

The leaders of main production administrations need to analyze carefully why, among subordinate organizations, there are those which from year to year have a decrease in value output. Why, for example, Moscow, Leningrad and Kiev subway construction administrations (the oldest and technically best-equipped organizations) and also Armtunnel'stroy [Armenian Tunnel and Subway Construction Organization] did not meet the target on labor-productivity growth even once in recent years? Meanwhile, value output for Tashkent subway builders more than tripled that of the Yerevan construction workers, more than doubled that of Kiev and Moscow builders, and was more than 1.5 times that of the Leningraders.

Or take this example. Sevzapmorgidrostroy is successfully fulfilling five-year plan targets for growth of labor productivity but Volgodongidrostroy, Novorossiyskmorstroy and Krynmorgidrostroy not only are not increasing but are even lowering the level of output in value terms exact expansion of the above organizations unknown; possible expansion, respectively: Trust (or Association) for Construction of Maritime and Hydraulic Engineering Facilities in Northwestern Regions; Volga-Don Hydraulic Engineering Construction, Novorossiysk Maritime-Facilities Construction, and Crimean Maritime-Facilities and Hydraulic Engineering Construction trusts (or associations).

The brigade form of labor organization, combined with cost accounting, is an important reserve for increasing output in production. Unfortunately, a considerable number of workers (31-46 percent) are still not in brigades in organizations of a number of main administrations. This impedes the growth of labor productivity and decreases the responsibility of workers for the production and quality of output.

In the collegium of the ministry there was consideration of the work of main administrations for ensuring fulfillment of targets established for the 11th five-year plan on increasing labor productivity. Stringent measures were taken against different leaders who had serious omissions in their work.

Our main duty lies in radical improvement of the organization of production, labor and management, elimination of work-time losses, and efficient use of construction equipment and motor transport. An all-out drive is needed for the efficient consumption and preservation of fuels and lubricants and for combating distorted write-ups in reports.

At the December (1983) Plenum of the CPSU Central Committee the mobilization of collectives of enterprises, scientific research and design organizations, and of all engineering-technical and scientific cadres for the acceleration of scientific and technical progress was called a task of paramount importance. The ministry has much scientific-technical potential and is investing considerable resources into its development. Much here, of course, is dependent on the concentration of efforts of scientists and designers on the solution of key problems in the branch. Work is being conducted in this direction.

During the period 1980-1983 around 100 models of new means of mechanization were developed in accordance with plans for new technology and recommended for series production. Over a period of a number of years there has been successful cooperation on problems of the cooperative production of equipment with West European firms.

However, the results of the past year attest to serious omissions in work on the development and mastery of new equipment in production. Leaders at all levels need to picture clearly for themselves that successful fulfillment of the task proposed by advanced collectives and supported at the December (1983) Plenum of the CPSU Central Committee -- to ensure above-plan growth of labor productivity and above-plan reduction of the cost of work -- will be possible only on the condition of further technical improvement of production.

An important labor-saving direction lies in shifting from brick to large-panel construction. During recent years the ministry has invested large resources into the development of the production base of large-panel house construction, the capacity of which is now 820,000 square meters. However, only 78 percent of the 1983 target was fulfilled for the turnover for use of large-panel housing (553 square meters were turned over for use, with a plan of 710,000 square meters). Only 46,000 square meters of large-panel house-construction structures were manufactured at three plants (Omsk, Apparatenenskiy and Chita) in the Main Administration for Railroad Construction in the Urals and Siberia and the utilization of capacities constituted, in all, 34 percent for this main administration. The Main Administration of Construction Parts and Assemblies Production, with only 70 percent of its plants' capacities in use, is not improving work on the output of large-panel house-construction structures. The majority of construction trusts and planning institutes are not now active enough in introducing such labor-saving structures as prefabricated room units. Experimental work conducted by the Main Administration for Railroad Construction in the North and West and the Main Administration of Railroad Electrification shows that it is possible to build not only switching stations and crossing booths from prefabricated room units but also transformer substations, automated transformer power-feeder points, and posts for electrical centralization of switches and signals at small stations.

The greatest effect is achieved on those construction projects where an agreement is in effect on the labor cooperation of collectives of planners, construction workers and the client. The obligations adopted by planners for the current year in support of the initiative of the builders on ahead-of-schedule opening of train traffic throughout the Baykal-Amur Main Line -- to ensure the fastest possible elaboration of technical documents and render prompt assistance to the builders in solving practical problems on the turnover of construction projects for utilization -- are commendable.

The VPTITransstroy All-Union Planning and Technological Institute of Transport Construction Institute must increase its influence on production. Its work should facilitate an improvement in the engineering and technical preparation of construction projects, an increase in technological discipline, and a reduction, on this basis, of unproductive expenditures and losses.

Analysis of results of the economic and financial activity of the Ministry of Transport Construction shows that the annual target for reduction of the cost of construction-installation work was fulfilled. At the same time, 69 construction trusts and administrations had a rise in costs.

The target set for the ministry on drawing above-norm reserves of commodity stocks and equipment into economic circulation is not being fulfilled. The reserves of uninstalled equipment for our own construction projects have increased and the volumes of unfinished construction-installation work are growing. The volume of "unfinished projects" in a number of construction trusts and administrations is more than double their annual program. There is a need for a sharp turn toward improvement of economic work at all levels of economic management and for the delivery of construction projects for utilization on a timely, uniform basis throughout the year.

Our organizations and enterprises have considerable reserves. It is natural, therefore, that targets established for saving construction materials and fuel and power resources are being fulfilled as a result of the implementation of organizational and technical measures. At the same time, shortcomings in the preservation and utilization of materials are being eliminated slowly. As checks made in 1983 showed, in a number of organizations and enterprises allocated materials in short supply were released to outside organizations. The cases are not infrequent when main administrations and trusts request the allocation of additional funds for materials, although they may be limited to the redistribution of resources among subordinate organizations.

Strict observance of state discipline in the utilization of material resources, the provision of conditions for their saving and careful use, and the observance of established norms of stocks must become the norm in the operation of each construction organization and industrial enterprise.

It is necessary for the Main Administration of Material and Technical Supply to increase operational efficiency, intensify work with suppliers for ensuring full realization of resources allocated to the ministry, make timely shipments from the offices' warehouses, and exercise effective control over the use and storage of materials in organizations and enterprises.

The leaders of construction projects and enterprises must provide conditions for high-quality work fulfillment and call slipshod workers to disciplinary and financial responsibility. There must not be a single case of waste which is not subjected to scrutiny.

The Ministry of Transport Construction is faced with responsible tasks in 1984. It is necessary to put into operation 364 km of new railroad lines and 686 km of second lines, electrify 1,058 km and equip over 3,500 km of lines with automatic block signaling and centralized traffic control, open the Baykal-Amur Main Line completely to through traffic (a year ahead of schedule), and build 2,400 meters of berths at maritime, river and fishing ports, 106,000 square meters of runways, 28 km of subway lines, around 1,400 km of hard-surface highways, and over 400 km of railroad sidings.

The volume of construction-installation work is growing sharply on the operational railroad network. Special attention must be devoted to these operations.

The volume of contract work on the development of the West Siberian petroleum and gas complex will constitute almost 700 million rubles. In subsequent years it will be sharply increased and the main administrations should adopt timely measures for reinforcement of the construction organizations located here.

In accordance with the social program defined by the 26th CPSU Congress, it is necessary to build and turn over for permanent utilization housing with a total area of 1,352,000 square meters and a number of other construction projects designed for social-services facilities.

Further development of the ministry's own production base is envisioned as well as the construction of housing and cultural-services facilities for transport construction workers.

Advanced collectives of transport construction workers were the initiators of socialist competition in the branch for overfulfillment of the 1984 plan and they have adopted intensive socialist obligations. These include collectives of the Nizhneangarsk Transport Construction Trust, Trust for Mechanization of Construction in the Urals, Pavlodar Transport Construction Trust, Transport Construction Trust for the Southwest, Belorussian Transport Construction Trust, North Caucasian Highway Construction Trust, Tyumen Highway Construction Trust, Transsignalstroy All-Union Trust of the Main Administration of Railroad Electrification, Ministry of Transport Construction USSR, Chernomorgidrostroy Hydraulic Engineering Construction Trust for the Black Sea Region, Tashkent Subway Construction Trust, Bridge Construction Trust No 10, and Promtrest Expansion unknown, and also Sibgiprotrans Siberian State Planning and Surveying Institute for Transport Construction, Bridge Detachment No 19 of Bridge Construction Trust No 6, and the Tayshet Road Building Machinery Repair Plant.

A characteristic feature of the socialist obligations adopted is the steadfast aspiration to achieve, through the use of internal resources, an above-plan increase of labor productivity of at least 1 percent and an additional 0.5 percent reduction of the cost of construction-installation operations and industrial output.

In the obligations which were adopted important significance is attached to the strengthening of labor and production discipline, an increase in the equipment and construction machines shift coefficient, a reduction in the labor intensity of work fulfilled, acceleration of scientific and technical progress, a decrease of losses of work time, and all-out saving of material and fuel and power resources.

The collegium of the ministry and trade union central committees have approved the initiative of the collectives and have recommended it for wide dissemination in the branch.

It is necessary to involve all workers and employees in socialist competition, create conditions for highly productive work and successful achievement of assigned tasks, and work to ensure that the obligations of each collective are supported by specific measures for additional utilization of internal resources and that effective control is established for their fulfillment.

Transport construction workers have everything necessary in order to ensure successful accomplishment of the tasks set for the Ministry of Transport Construction by the USSR State Plan of Economic and Social Development for 1984.

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## INTERSECTOR NETWORK DEVELOPMENT

### CEMA EFFORTS TO INTEGRATE MARITIME TRANSPORT WORK

Moscow MORSKOY FLOT in Russian No 2, Feb 84 pp 2-5

[Article by L. Grankov, adviser, Transport Department, CEMA Secretariat:  
"Maritime Integration of CEMA Member Nations"]

[Text] Socialist economic integration, which is based on public ownership of the means of production and a planned economy, has become a powerful lever for the all-round intensification of the economy of countries belonging to the socialist community. As a result of the expanded scale, improvement and greater depth of fraternal, mutually advantageous cooperation, the rate of economic development of CEMA member nations is steadily accelerating. Their reciprocal trade turnover is also on the rise. It increased 3.7 fold between 1971 and 1982.

"We are trying," Yu. V. Andropov, general secretary, CPSU Central Committee emphasized at the November (1982) Plenum of the CPSU Central Committee, "to make the comradely cooperation and socialist mutual aid of fraternal countries deeper and more effective, inter alia, in the joint effort to resolve scientific-technical, production, transport, energy, and other problems.

The continuously developing foreign economic relations of CEMA member nations, which trade with almost all countries in the world, including many developing countries of Asia, Africa and Latin America, predetermine the paramount importance of maritime transport in the shipment of foreign trade cargo. The enlargement of the fleets of countries belonging to the socialist community with specialized large vessels that possess high operating speed and that ensure the integrity of cargo, has led to the most advantageous use of tonnage to deliver foreign trade goods of CEMA member nations sold c.i.f. and purchased f.o.b. This circumstance has also prompted shipowners in socialist countries to make their tonnage available to the world charter market for carrying ballast and incidental cargo ("v. ballastnykh i poputnykh napravleniyakh"), which increases the degree of effectiveness with which the vessels are used.

By the end of 1982, the maritime transport fleet of CEMA member nations (People's Republic of Bulgaria, Hungarian People's Republic, Socialist Republic of Vietnam, German Democratic Republic, USSR, Republic of Cuba, Polish People's Republic, Socialist Republic of Romania and the Czechoslovakian Socialist Republic) consisted of more than 2,600 vessels with a combined gross tonnage of approximately 21.6 million register tons and a deadweight of 31.4 million tons (vessels with gross tonnage of 100 or more register tons are counted; vessels in the passenger, technical

auxiliary and fishing fleet were not counted). The deadweight of the transport fleet of CEMA member nations increased more than 14 fold compared with 1951.

The quantitative growth of the fleet has also been accompanied by major qualitative changes: relatively small general-purpose ships have been replaced by highly specialized ships with large cargo space and; production processes are widely automated; sophisticated technical means of navigation; and means for controlling shipboard equipment and systems are used. Fleets of CEMA member nations are continuously being enlarged with container ships, RO-RO's, lighter carriers, seagoing ferries, gas transport, chemical transport and other types of ships. To a considerable degree, the fleet is enlarged by means of reciprocal shipments.

In addition to the fleet, ports have been developing at a rapid rate. A number of socialist countries have built new ports to process bulk and liquid cargo and containers. Existing ports are being rebuilt and modernized: new moorages and specialized transshipment bases are being built; approach channels and port landing areas are being dredged; cargo-handling processes are being mechanized; warehouse areas are being expanded. The capacities of ship repair facilities are being developed in order to answer the fleet's repair needs more fully.

The work of the CEMA Permanent Commission for Cooperation in Transport and its specialized water transport agency (Section No 3) is directed toward the earliest and effective implementation of large-scale integration measures coordinated between the countries for the period up to 1990 and included in the Special Long-Range Program for Cooperation in the Development of Transport Relations Between CEMA Member Nations.

One of the basic directions of this activity is the coordination of the long-range plans for the development of transport and the improvement of its interaction at points where national transport systems intersect. The principal goal is to attain high end results, to secure the complete and timely satisfaction of the ever growing requirements of the national economy and the population of fraternal countries for maritime shipping.

CEMA member nations support the highly effective operation of economic production enterprises. The largest among them are: the USSR-People's Republic of Bulgaria sea-rail ferry crossing (1978); the international economic navigation enterprise: "Interlikhter" (1978); international companies: "Dunaytrans" (1976) and "Intermorput'" (1979); and the system for the day-to-day control of haulage and the processing of tonnage on the Danube River (1981).

In the 5 years the USSR-People's Republic of Bulgaria sea-rail ferry crossing has been in operation, tens of millions of tons of cargo important to the national economy of both countries have been shipped without transshipment, the number of ferry runs has been significantly reduced and the carrying capacity of this transport system has been increased. At the beginning, a round trip took 128 hours. Today a round trip takes 56 hours. Freight handling time has been reduced to one-third of the previous level in the ports of Ilichevsk and Varna. Soviet and Bulgarian specialists have developed and are introducing normative documents that improve the

interaction of seagoing ferries and port loading complexes and that accelerate the performance of customs and other operations. The "Parom" [ferry] ASU [automated control system] is being put into operation.

"Interlikhter" -- the international economic navigation enterprise -- is the first multilateral transport enterprise of CEMA member nations (People's Republic of Bulgaria, Hungarian People's Republic, USSR and Czechoslovakian SSR). "Interlikhter" has at its disposal 200 "Danube-sea" type lighters, 2 lighter carriers ("Tibor Samuelyi" and "Yuliush Fuchik") and 670 standard international containers. "Interlikhter" has mastered the most complex type of "river-sea" shipping operations: between Danube River ports and the seaports of Bombay and Karachi (a distance of 2415 kilometers by river and 4310 miles by sea) as well as between Danube River ports and Mekong River ports in the Socialist Republic of Vietnam and Kampuchea, and the seaports of Saigon and Penang (2896 kilometers by river and 6760 miles by sea). The new deep-water port of Ust-Dunaysk has been built to support the operation of the lighter carrier system in the USSR.

In a relatively short time (1978-1983), "Interlikhter" has won international recognition among charterers notwithstanding the opposition of capitalist navigational conferences that serve the lines between Europe and regions of the Indian Ocean and Southeast Asia. This navigational enterprise is considered reliable and highly effective. The total shipping volume exceeded 1.6 million tons. Clients are particularly interested in shipments of heavy, outsize cargo: locomotives, transformers, buses, roadbuilding machinery, tank cars. Lighters are successfully transporting massive quantities of rubber from Malaysia, the Socialist Republic of Vietnam and Kampuchea to customer plants situated on the Danube without transshipment.

The work experience of "Interlikhter" is carefully studied and generalized by foreign trade shipowning organizations of interested CEMA member nations. The possibility of expanding the area served by the lighter carrier system, of making Sri Lanka and Thailand ports of call, of transporting cargo to and from Laos and of using feeder-type lighter carriers in Southeast Asia is under consideration. The economic feasibility of using the lighter carrier system in the Baltic, in traffic with the Republic of Cuba, with countries on Africa's west coast and on the east coast of South America is also being studied.

The Soviet-Bulgarian "Dunaytrans" company is engaged in a large-scale effort to improve the use of the production capacities of the fleet and ports on the Danube in the shipment of foreign trade goods between the USSR and the People's Republic of Bulgaria. The Soviet-Bulgarian "Intermorput" society is performing more and more complex dredging, towing, underwater technical and emergency rescue operations on the Black Sea.

The system for the day to day control of haulage and the processing of tonnage on the Danube river has been in operation for only about 2 years. The system was established on the basis of an agreement between the Bulgarian River Steamship Line, the Romanian River Steamship Line, by the Soviet Danube Steamship Line, the Czechoslovakian Danube Steamship Line and the international "Interlikhter" enterprise. Nonetheless, even in such a short time, the cooperating navigational organizations have succeeded in

reducing idle time of tugboats and the non-self-propelled fleet and in increasing the effectiveness of operation of means of transport to the mutual gain of all participants.

"Interport," which was founded by the Polish People's Republic and the GDR in 1973, is working fruitfully. It promotes the rational use of the production capacities in the ports of the indicated countries, the optimal selection of points for loading and unloading of ships and the introduction of modern means of totally mechanizing freight handling operations.

Analysis of the work of joint maritime transport enterprises of CEMA member nations convincingly attests to the great potential for their further development, to the benefit resulting from the increased international specialization and cooperation in production.

The improvement of the mechanism underlying the scientific and technical cooperation of CEMA member nations is an important factor in increasing the effectiveness of the interaction of their maritime transport. We must broaden and deepen direct ties between the head scientific and project-planning institutes and organizations in the maritime transport of fraternal countries.

For many years, Soyuzmorniiprojekt [State Planning, Design and Scientific Research Institute of Maritime Transport of the USSR Ministry of the Maritime Fleet] and TsNIIMF [Central Scientific Research Institute of the Maritime Fleet] have been engaged in joint research with the Water Transport Institute of the People's Republic of Bulgaria, the GDR Combine of Maritime Transport and Ports, with the Maritime Institute and project-planning institutes in the Polish People's Republic, with scientists and engineers of the Republic of Cuba, the Socialist Republic of Vietnam, the Hungarian People's Republic, the Czechoslovakian SSR, and other CEMA member nations. Multilateral and bilateral scientific-technical cooperation of institutes and organizations of fraternal countries is based on agreements and contracts and embraces such areas as the forecasting and planning of the development of the fleet and ports, the improvement of shipping technology, the application of highly effective technological transport systems, the development and introduction of automated control systems, etc.

As a result of joint research efforts, lumber, round timber, canned foods, fruit and vegetables, ferrous and nonferrous metals, packaged products, fertilizers are shipped in packets by sea between the People's Republic of Bulgaria, the GDR and other socialist countries. Such a mode reduces idle time by almost 20 percent and increases the labor productivity of port workers 1.5-2 fold. The packet shipping system that was developed jointly by Soyuzmorniiprojekt and the Administration for the Operation of the Fleet and Maritime Ports of the Republic of Cuba for the purpose of shipping bagged freight in synthetic slings produces an economic effect of one ruble for every ton of freight. Progressive technology for shipping perishables between ports in the Socialist Republic of Vietnam and the USSR will significantly reduce operating costs.

Much attention is devoted to the elaboration of the basic principles of the automated system for exchanging information on maritime shipping which will make it possible to make better use of the fleet and to reduce the time the fleet is idle in ports. The estimated economic effect from the introduction of this system will be in excess of 350,000 rubles.

Urgent problems in marine law and navigational policy are being investigated more and more intensively. Specialists in interested CEMA countries are standardizing individual legal norms used in international maritime navigation. In addition to working on theoretical and practical problems in the area of maritime law and navigational policy, CEMA member nations are also devoting much attention to commercial questions pertaining to the operation of the fleet, to forecasting changing conditions in the charter market, to improving the chartering of tramp, to reserving line tonnage, to the creation of joint lines. At the same time, close contacts are maintained with the Conference of Charter and Shipowning Organizations of CEMA Member Nations.

Research on the conservation of material and labor resources, on the automation of production processes on ships, in ports and ship repair yards is an important direction in the scientific and technical cooperation of maritime institutes, enterprises and organizations. Much attention is devoted to implementing the Program for the Protection of the Environment Against Pollution. The program, which was approved in 1982, calls for supplying enterprises with nature-conserving instruments and equipment in order to meet the demands of the MARPOL-73/78 Convention; with with modern technical means for combatting oil spills in ports and in the coastal zone. The program also calls for the development of methods and technologies for making careful and rational use of natural resources in the operation of ships and coastal maritime transport facilities.

Maritime transport branches, enterprises and organizations of CEMA member nations presently possesses mighty material-technical and scientific potential. The full utilization of this potential will permit the successful resolution of complex problems pertaining to the intensification of economic production activity in the interests of the economic growth and well-being of the peoples in each fraternal country and in the socialist community in general.

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## INTERSECTOR NETWORK DEVELOPMENT

### ROLE OF MARITIME FLEET IN ARCTIC REGIONS DEVELOPMENT STRESSED

Moscow PRAVDA in Russian 29 Mar 84 p 2

[Article by N. Bratchikov, PRAVDA correspondent in the city of Vladivostok:  
"Full-Scale Mastery of the Arctic"]

[Text] "To insure the timely delivery of freight to the rayons of the Far North and the Far East. To build up the capabilities of ports and ship-repair enterprises".

[From the "Basic Directions in the Economic and Social Development of the USSR During 1981-1985 and Out to the Period 1990"]

The eastern part of the Arctic is difficult and severe. Ship convoys led by powerful icebreakers begin to punch their way through for the first time only in the middle of June. Until then, dozens of northern ports and small population centers are tightly sealed by masses of ice that descend from the eastern Siberian Sea under the pressure of northwest winds.

The extreme conditions, however, have not interfered with the rapid and harmonious development of the economy of Yakutiya, Magadan Oblast and Chukotka. Here, deposits of nonferrous and rare metals, coal and other minerals are being developed. There are many fur-bearing animals and sea mammals and fish in these krays. The breeding of reindeer is being expanded.

The life and work of the people in the North are inseparably linked with sea transport which delivers everything necessary here: food products, clothing, raw materials, fuel and lubricants, building materials, machinery, and mining equipment. The northern ports are transformed during the navigation period into key transshipping areas which feed an enormous region. Two of them are central ones: Pevek and Egvekinot. Their berths can accept ocean-going vessels. Powerful gantry cranes work here around the clock. All processes are mechanized -- new equipment is operating in the holds of the ships, in the warehouses and on the berths.

Two streams of freight intersect in Pevek-- hundreds of thousands of tons of every possible type of freight are removed from the site by shallow-draft

vessels and are brought over the almost impassable Kolyma River bars to Zelenyy Mys and even further -- to the upper reaches. The other part is taken away by motor vehicles over winter roads to Bilibino.

The growing requirements of the Far North and the annually increasing trans-shipment volume are forcing the seamen of the Far East Shipping Company to expand their Arctic operations, to look for new and effective operating methods for the fleet and berthing lines, and to improve cooperation with their numerous clientele.

It is important to adjust correctly mutually beneficial contacts with cooperating partners -- the railroad, automotive transport workers and the Dal'-ryba Association. For example, much has been done during the five years to improve the Vladivostok and Nakhodka transportation centers which are treated with special attention for the movement of Arctic cargo from the shipper to the recipient. Optimum periods for cargo concentration in ports have been introduced. All vessels, which receive orders for the Arctic, are repaired first in the best ship-repair yards. Almost 40 percent of the freight, which is transported on the Arctic route, is now being sent in containers and bags. This provides a great savings in time with respect to the ships' mooring in ports. A new and effective method for loading containers with the help of devices using an air cushion has been tested quite recently. It increases the longshoremen's labor productivity fivefold.

The Shipping company conducted experiments a year ago in the Sea of Okhotsk and the Bering Sea. Their goal was to organize the sailing of transport vessels under winter conditions. Motor vessels now travel year round to the Chukchi ports of Egvekinot and Provideniya. The Arctic navigation period is also beginning at earlier periods. This is permitting the shipping company to cope with its shipment plans and to supply the northern national economic complex with food and material and technical resources without interruptions until the new navigation period.

The persistent work of the fleet and the prospects for the expansion of sailing over the entire northern sea route have provided the country's Ministry of Maritime Fleet with an opportunity to begin solving such important problems as the conducting of experimental cargo trips in Norilsk-type vessels from Murmansk to Pevek during the winter-spring period. Next are test shipments of imported goods from Japan to the western ports of the USSR over the northern sea route.

However, the north has an abrupt and stern disposition. The Arctic demonstrated it during the last navigation period with all its strength. Vessels were not able to move in convoys even during the favorable summer period because of ice barriers that were formed in the straits. The icebreakers dragged them through one by one. In the autumn when an enormous mass of ice "piled up" with all its weight on the coast, two large groups of vessels were imprisoned. The battle of the icebreakers for each mile lasted until the beginning of December. The victory over the Arctic was not achieved easily. Part of the fleet from the ports of Pevek and Zelenyy Mys went home through the western basins. As a result of this the shipping company did not fulfill the Arctic shipping plan.

Much time has passed since the ice battles. On the threshold of the new navigation period, the seamen are thinking about how to master the Arctic further. They are now engaged in developing a new freight delivery schedule in the Transportation and Operation of the Fleet and Ports Main Administration. Part of it will go from the west -- through Leningrad and Murmansk. Economic calculations will show how effective this will be.

V. Mis'kov, deputy chief of the Far East Shipping Company, thinks: "It is undoubtedly necessary to change the old schedule. However, it should be changed so that the reserves in the Far East are used to the maximum even under complicated conditions and with the growing freight volumes...."

In what do the seamen see these reserves? Primarily, in the raising of the supplier's discipline. As if forgetting that we are talking about the severe Arctic, they violate the stipulated final periods for providing freight to the base ports. Cement, petroleum products and other freight arrive in Nakhodka and Vladivostok a month and more late.

Packaging standards are also being ignored. The union Ministries of Procurement and of Mineral Fertilizer Production and the Russian Ministry of Trade are sending freight that is not packaged and are poorly using containers. Inspections of the Gossnab bases in the northern ports have shown that there is no equipped or even cemented freight area at a single one. Equipment, which is required for transshipping operations, is lacking there. The ships sit for a long time at the berths while the longshoremen extract the cargo from the holds almost piece by piece. Transportation schedules are also being violated. First, the motor vessels arrive in the port of Magadan which is filled to overflowing without it, and then -- after readdressing -- the cargo is sent to the Arctic on other motor vessels. Wouldn't it be simpler to do this in Nakhodka or Vladivostok where there exist specialized berths?

The problem of packaging and containers is an especially critical one for the north.

V. Mirzabeyli, the deputy director of the office for planning and organizing container shipments in the All-Union Morkonteyner Association, says: "The containerization of all freight on this route would help to solve an entire complex of tasks. Here, there are personnel, housing, the construction of warehouses, and the elimination of vessel demurrage."

The containerization of Arctic freight traffic is taking place, but it is still one-sided. As times, there is not enough work for the high-capacity terminals which have been built on the shores of the Sea of Japan. To make up for this, neighboring berths are overloaded. A graphic example of this is the Vladivostok commercial port which was "sewn up" during the last navigation period. The Ministry of Maritime Fleet and the USSR Gosplan have developed a joint long-range program for shipments in packaging and containers, but it is being fulfilled poorly.

The seamen often place claims against their cooperating partners. But are they themselves using all of their capabilities? Before the 1984 navigation

period, the Far East Shipping Company suggested a schedule for delivering freight to the Arctic. Its essence consisted of using only motor vessels with a carrying capacity of no less than 14,000 tons on the most difficult route--the Kolyma-- instead of small-tonnage vessels. They could be unloaded in Pevek and directly at the Kolyma River bar by a small fleet. It is planned to make the Chukchi port of Provideniya, to which it is possible to deliver coal by a small fleet long before the navigation period and then move it to Pevek on powerful coal carriers, another transshipment base.

The method is economical, but it reveals a disproportion between the fleet, which is being developed, and today's condition of the northern ports. Although a great deal in them has been changed for the better, the traffic capacity of Pevek, Provideniya and Egvekinot still does not correspond to the increasing stream of cargo. They have been well adapted for traditional vessels. The new transportation giants, such as the Nizhneyansk and the M. Strekolovskiy, which have begun to operate in the Arctic, still do not have enough berths. This means that the Ministry of Maritime Fleet must become concerned about the construction of deep-water berths-- even if only a few.

The future of the Beringovskiy coal deposit, the construction of the Amguyem-skaya Hydroelectric Power Station and the increasing delivery of equipment to Shmidt Cape dictate the necessity of combining the efforts of a number of branches-- the Ministry of Coal Industry, Ministry of Nonferrous Metallurgy and Ministry of Power and Electrification -- with those of the seamen. In the northern economic centers, it is necessary to construct a winter route, build a transshipment coal complex and storage, and complete the construction of a lighter base.

V. Yetylen, secretary of the Chukchi CPSU Okrug Committee, explains: "The delivery of food products, freight, equipment, and fuel to the numerous unequipped villages on the seacoast and in the basins of the tundra rivers is an urgent problem. We delivered everything by barges during the Thirties and Forties. Subsequently, small vessels sailed to them. They have become morally and physically obsolete, and there is still nothing to replace them ...."

The technical concerns of the Arctic's eastern sector are closely intertwined with social ones. Here, changes for the better are noticeable. In Pevek, a small city for the port workers with stores, a dining hall, kindergartens and a gymnasium has grown next to the berths. Near the entrance is a dispensary. There are also hothouses where tomatoes and cucumbers ripen, vegetables grow, and roses blossom. However, this good example has still not been expanded everywhere in the North. In Anadyr, Beringovskiy, Egvekinot, and Provideniya, there are long lines for housing and few comfortable hostels with all the amenities. They are not solving social and everyday services in an integrated manner here but, you see, a normal life for the people in the Arctic is just as necessary as safe navigation and the delivery of freight. That is why the Ministry of Maritime Fleet and its Far East Shipping Company must take this problem into account during the coming navigation period. The Arctic must be mastered in an integrated manner.

## INTERSECTOR NETWORK DEVELOPMENT

### DISPOSABLE BULK CARGO CONTAINERS FOUND TO BE REUSABLE

Moscow TRUD in Russian 27 Mar 84 p 2

[Article by P. Nikerov, pro-rector for scientific work of the Institute for Maritime Fleet Engineers, and V. Kaufman, leading engineer, Odessa: "A Container Suitable for Everything"]

[Text] It is difficult to overestimate the importance of a single-use soft container for the shipment of dry cargo. It almost completely eliminates manual labor, sharply improves the working conditions of the loaders, and significantly accelerates the processing of motor vehicles, freight cars and vessels. However, fewer single-use soft containers than are required are still being produced in our country.

Meantime, there is a way out. The Odessa Institute for Maritime Fleet Engineers and the Krasnovodsk commercial port conducted an experiment in 1983 with a representative of the Karabogazsul'fat Production Association. Its purpose was to determine whether a single-use container could be used many times. It turned out that it was possible up to 10 times! Only insignificant improvements in the construction of this packaging are required. A change in the technology of making them is not even required for this.

Today, many recipients of goods do not want to receive the products in soft containers because of their high cost. The repeated use of this packaging will solve the problem. A load handling device, which provides for the automatic freeing of the container during unloading and which excludes manual labor in this sector, has been developed in our institute.

It seems that it would be worthwhile for the USSR Gosnab to examine the question of the repeated use of single-use soft containers.

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## INTERSECTOR NETWORK DEVELOPMENT

### AZOV FLEET UNHAPPY WITH DNEPR RAILROAD COORDINATION

Moscow VODNYY TRANSPORT in Russian 3 Apr 84 p 1

[Article by V. Zhivotkov, special correspondent in the city of Zhdanov: "A Solution Is Required"]

[Text] The Azov Shipping Company alerted all interested organizations and enterprises in good time -- in the middle of February -- that the fleet would be ready to begin shipments of hot sinter from Kamysh-Buruna to Zhdanov on 10 March. The railroad workers would be freed of sinter shipments by this.

However, the weather offered the sailors an opportunity to begin the planned shipments earlier. On 28 February, a telegram was sent from the shipping company to four addresses: the Ministry of Ferrous Metallurgy of the Ukraine, The administration of the Dnepr Railroad, the Azovstal' Production Association, and the iron ore combine. It said: In connection with the favorable ice situation on the Sea of Azov, we ask that you switch the shipment of hot sinter from Kamysh-Buruna to Azovstal' from completely using railroad transport to sea transport beginning on 7 March.

No one, however, replied to this telegram. Three times-- on 1, 5 and 6 March-- the shipping company again sent a telegram to the former addresses with a request to urgently confirm the agreement for the beginning of sinter shipments ahead of time using sea transportation. Again silence.

10 March arrived. The Makar Mazay Motor Vessel was the first to approach the berth at the Azovstal' plant with cargo: behind it, came the second one-- the Nikitovka. They were not unloaded, however. The railroad workers are continuing to pursue freight cars with sinter.

On 14 March, the Azovstal' arrived at the unloading point; on 15 March -- the Yenakiyevo; and on 16 March -- the Arshintsevo. These motor vessels stood idle unproductively at a time when the plant continued to accept freight cars with sinter.

Each day, the motor vessels could have supplied the blast-furnace workers of the Azovstal' plant with 10,000 tons of hot sinter, freeing 160 gondola cars at the same time!

For many years, strong business-like cooperation, which permits new work successes to be achieved, has united the participants in the full-scale socialist competition to achieve the best final results -- miners, seamen and metallurgists. The present interruptions in the work of the cooperating partners is a greater pity. A clear opportunity -- beginning on 7 March -- to transport 100,000 tons of hot sinter by sea was neglected. The blast-furnace workers were not able to use sinter at a higher temperature and, naturally, had to lower the productivity of the blast furnaces. During the 10 days, the railroad workers could have freed more than 1,600 gondola cars and used them to transport other national economic freight.

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END